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CONTENTS

	PAGE
Editorials	345
Letters to the Editor	350
Publications Received	351
The Scrap Heap	352
Overseas Railway Affairs	353
Reconditioning Points and Crossings on the Burma Railways	355
The Railways of Czechoslovakia	355
Railways and Road Transport Section	357
Wireless Signalling for Shunting Yards	369
Railway News Section	371
Personal	371
Notes and News	374
Contracts and Tenders	378
Official Notices	379
Railway Share Market	380

The L.M.S.R. Meets a Rush Hour Emergency

A DIFFICULT situation was met with commendable promptitude by L.M.S.R. engineers and operating staff on Monday last, when a failure in the feedwater supply to the boilers at the Stonebridge Park generating station brought to a standstill all electric suburban trains on the Euston—Watford, Broad Street—Richmond, and Broad Street—Watford lines between 9.10 and 9.30 a.m. Bakerloo tube trains north of Queens Park were similarly affected. Energetic steps were at once taken to provide emergency steam trains, and a shuttle service was instituted between Euston, Watford, and intermediate main-line stations (including Queens Park) by making use of the engines and coaches of two outer suburban trains to Broad Street, which had been diverted to Euston owing to the blocking of the Broad Street line east of Queens Park by stationary electric trains. Other steam trains were put into operation, and existing services altered to make additional calls between Euston and Watford. Meanwhile, passengers in stranded electric trains were conducted to the nearest stations. The loudspeaker equipment at Euston proved of great value in keeping passengers informed of the special arrangements. Fortunately, the fault at Stonebridge Park proved more amenable than had at first been feared, and thanks to the energetic steps taken by the engineers, electric trains on the Watford—Queens Park section were restored soon after 11 a.m. All services had returned to normal by 1 p.m.

More Loudspeaker Developments

The G.W.R. is making increasing use of loudspeaker equipment for controlling crowds at stations during busy periods. Paddington and Snow Hill (Birmingham) are already equipped, and the company is now extending the system to Cardiff. The last-named installation will have six speakers over platforms Nos. 1 and 2, six over platforms Nos. 3 and 4, and five in the booking halls and passenger subway, a total of 17 in all. Special attention has been given to the directional qualities of the speakers, for it is intended to make simultaneous (but, of course, different) announcements on the up and down sides. In addition to permanent installations, the G.W.R. recently brought into use a portable unit for service at any station where special crowds are expected for such events as football matches and race meetings. As mentioned in our previous note, the L.M.S.R. loudspeaker equipment at Euston proved of considerable utility in making known the emergency arrangements brought into service on the failure on Monday last of Stonebridge Park power station and the consequent replacement of electric suburban services with steam trains. Incidentally it will be recalled that in our issue of August 6 we made reference to the German practice of prefacing announcements by the words "Hello—Hello—Hello," and it is therefore of interest to record that the L.M.S.R. has recently adopted a similar practice by prefacing announcements at Euston with the words "Hello—Euston Calling," which serves both to intimate that instructions are about to be given and also to give an indication of pitch and voice.

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The Week's Traffics

Compared with the corresponding week of last year an increase of £117,000 is shown by the four group railways for the past week, which is slightly above expectations. On the passenger side the increase is £54,000, merchandise receipts are £41,500 up, and coal shows a net gain of £21,500. For the year to date the combined receipts of the four companies amount to £103,720,000, an increase of £4,423,000, or 4·45 per cent. Passenger train takings have reached £47,208,000, an improvement of £2,088,000; the merchandise receipts of £35,483,000 show a net gain of £1,060,000; and in the coal class traffics of £21,029,000 there is a net increase of £1,275,000.

	33rd Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	+ 26,000	+ 11,000	− 5,000	+ 32,000	+1,625,000	+ 4·05
L.N.E.R. ..	+ 17,000	+ 16,000	+ 18,000	+ 51,000	+1,444,000	+ 4·97
G.W.R. ..	+ 4,000	+ 13,000	+ 11,000	+ 28,000	+ 852,000	+ 5·13
S.R.	+ 7,000	+ 1,500	− 2,500	+ 6,000	+ 502,000	+ 3·73

London Transport receipts for the past week, at £535,500, are £10,000 down, but for the 8 weeks of the current financial year are up £27,200, at £4,448,000.

* * * *

Port of London Authority

The report of the Port of London Authority for the year ended March 31, 1937, shows an improvement in gross revenue and on the whole, an increase in the business done. Total tonnage of imported and exported goods (foreign, coastwise, and transhipments) increased by 4·8 per cent. Imports from overseas, amounting to 17,707,831 tons, showed an advance of 3·5 per cent., and the overseas exports of 3,487,223 were 3·2 per cent. higher. Coastwise imports (15,810,371 tons) increased by 5·4 per cent., and coastwise exports (2,349,191) by 1·4 per cent., and the transhipments of 1,758,531 tons advanced by 13·9 per cent. There was an increase of 0·4 per cent. in the net register tonnage (44,187,727) of vessels paying river duties of tonnage, but in the tonnage (25,409,696) of

shipping using the wet docks there was a drop of 0·6 per cent., and the shipping entering the dry docks fell from 3,104,195 tons gross to 2,679,595. Import goods landed at the docks for warehousing or immediate delivery amounted to 2,306,092 tons, an increase of 142,853 tons, or 6·6 per cent., and there was a rise of 50,818 tons in the export traffic of 728,813 tons handled on the dock quays. Total revenue advanced from £5,668,279 to £5,786,938, and total expenditure from £4,082,354 to £4,253,212, leaving a balance of revenue £1,533,726, against £1,585,925. Interest and sinking fund charges, less interest receivable, amounted to £1,534,340, leaving a deficit of £614, compared with a surplus of £6,166 for the previous year.

* * * *

Overseas Railway Traffics

The principal increases in Argentine railway traffics during the past week have been those of the Buenos Ayres Western and Buenos Ayres & Pacific with improvements of £19,948 and £10,836 respectively. On the Central Argentine there has been a fall of £10,425 during the same period, but this goes against the substantial increase of £55,737 shown in the corresponding two weeks a year ago. In the seven weeks of the current financial year the Central Uruguay shows a decrease of £234 and of 83,828 Uruguayan dollars, accompanied by a rise in exchange from 24¾d. to 27 7/32d.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	8th	80,707	+ 4,960	608,499	+ 42,545
Buenos Ayres Great Southern ..	8th	117,742	+ 4,502	900,062	+ 68,870
Buenos Ayres Western	8th	53,350	+ 11,874	346,961	+ 44,350
Central Argentine	8th	132,115	— 6,063	1,065,445	+ 69,152
Canadian Pacific	34th	512,400	— 8,000	17,311,000	+ 1,107,000
Bombay, Baroda & Central India	20th	200,100	+ 21,675	3,507,525	+ 252,375

Traffics on the Leopoldina Railway show a decrease of 87,000 in currency for the past week, but a rise of £2,743 in sterling, the average rate for the milreis having improved from 2·79d. to 3·19d.

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Remarkable Results on the N.W.R. (India)

Presiding at the 155th meeting of the North Western Railway Lahore Advisory Committee, the Agent, Lt.-Col. C. F. Carson, M.C., R.E., laid before the committee a note showing the financial results of the N.W.R. for the year ended March 31, 1937. Gross earnings amounted to Rs. 17·61 crores (£13,207,500); coaching earnings increased by Rs. 13 lakhs (£97,500) and goods earnings by Rs. 1·35 crores (£1,012,500), as compared with the previous year. Working expenses totalled Rs. 11·89 crores (£8,917,500), including contribution to the Depreciation Reserve Fund, so that the operating ratio, allowing for this contribution, was 67·54, as compared with 73·05 in 1935-36. Net earnings, Rs. 5·72 crores (£4,290,000), exceeded those for the previous year by Rs. 1·28 crores (£960,000). Capital at charge on March 31 last amounted to Rs. 113·05 crores (£84,787,500) for the commercial sections of the line, and to Rs. 33·79 crores (£25,342,500) for the strategic sections—lines built and operated for military purposes along and near the North West Frontier—so that the total for the whole system was Rs. 146·84 crores (£110,130,000). The net earnings therefore showed a return of 3·90 per cent., a remarkable figure seeing that one quarter of the capital relates to strategic lines, which are not expected to be remunerative. The total interest charges payable for the year under review were, however, Rs. 5·89 crores (£4,417,500), a figure that the above net earnings failed to cover by Rs. 17 lakhs (£127,500). But the note explained that there were certain other miscellaneous receipts and charges which had not been taken into account, which would just be sufficient to swing the balance in the other direction and show a net profit on the whole undertaking. In view of geographical and strategic considerations, this result must be considered as very satisfactory, and one upon which the North Western Railway administration deserves congratulation.

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The Reliability of Steam

It is a remarkable fact that the seven longest daily non-stop runs of the world's railways, whether operated by diesel power, electricity, or steam, are found within the narrow confines of Great Britain, and, furthermore, that all of them are worked by steam locomotives. They are headed by the two 392·7-mile journeys of the L.N.E.R. Flying Scotsman, now speeded up to a 7-hr. journey at 56·1 m.p.h.; next come the four L.M.S.R. non-stop runs between Euston and Carlisle, 299·1 miles, of which the two of the Coronation Scot are timed at 63·4 m.p.h.; and then the Newcastle-King's Cross journey of the L.N.E.R. Coronation, scheduled at 68·0 m.p.h. On the mainland of Europe the Paris-Limoges non-stop run of the Paris-Orleans-Midi Barcelona Express, 250·3 miles, comes next in the list, but this is electrically worked, and if steam alone be concerned, the Glasgow-Crewe run of the L.M.S.R. Night Scot (243·3 miles), the new Euston-Morecambe run of the same company's Ulster Express (234·3 miles), and the King's Cross-Darlington runs of the L.N.E.R. Silver Jubilee—the last-named timed in each direction over 232·3 miles at 70·4 m.p.h.—all take precedence of the longest Continental non-stop journey with steam, which is over the 226·7 miles between Paris and Liége. In addition to the eleven British runs of between 232·3 and 392·7 miles, also, at the height of the summer season the L.M.S.R. is working daily over the 263·6 miles from Euston to Holyhead without a stop, giving the first twelve places for non-stop running with steam to Great Britain.

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The Angle of Repose

Travelling recently on a French mountain railway we had an interesting experience which should be recorded for its lesson. At the conclusion of long railway journeys our physical condition has been observed generally to vary with the comfort of the seating accommodation. After eight or ten hours in, for example, a standard second class carriage on the Swedish State Railways, we have been delivered at our destination rested and refreshed—rested because the shape of the seat is such as to support the human frame in a reposeful attitude, refreshed because our undiverted attention could be given to the delights of that choice country. The Swedish seats, incidentally, are not deeply cushioned, but their tilt and the shape of the back support are nicely calculated. On some journeys elsewhere, however, after much less than eight hours, we become restless and weary because the carriage seat has been thoughtlessly shaped, even though the cushions may be sumptuous. But to return to where we began: The seat upon which were were perched in the mountain railway train was hard and not much tilted, and the back was but slightly sloped so that the weight of the torso fell nearly vertically. Yet within a few minutes of the start we became conscious of a feeling of rest we had not expected in such conditions. The simple explanation was that the train was climbing a 1 in 11 gradient! That so small a change in the angle of the seat can make so great a difference to comfort is surely worth record.

Special Equipment at Cincinnati Union Station

Among the numerous special features of equipment at the new Cincinnati Union station in the U.S.A. (described on page 306 last week) is an elaborate system of belt conveyors, hatches and chutes, between the platforms, the sorting points and the post office, for the rapid handling of parcel mails, which aggregate some 70 car loads a day. Then, too, in the locomotive running shed, which is of the segmental roundhouse type, special 500-W. lights are installed so that their beams are directed upon the running gear of the locomotives. There is also a direct steaming system which supplies 30 engine roads for refilling and re-steaming locomotive boilers, and seven other roads are equipped for maintaining a working steam pressure in the boilers without fires. Also as there are three pit fire-lighting stations for lighting up purposes as the engines are moved out from the steaming stations, there is a complete elimination of locomotive fires from the shed, which is therefore constructed of steel without the risk of corrosion. A D. & M. cleaning, and a 600-ton coaling plant are installed; from the latter fuel can be delivered to six tracks simultaneously from overhead bins. A general power plant provides steam for heating the buildings, for preheating cars, for locomotive direct steaming, also power for air compressing and for the electro-pneumatic signalling equipment.

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Signal Lights during "Black Outs"

Reports of the recent experimental "black out" in the Southampton—Portsmouth district dwelt on the fact that railway signal lights, which are of the long-burning oil type except for the colour-lights at Portsmouth, were visible, but to what extent was not stated. It is announced that a committee has been officially appointed to consider the running of railway services under "black out" conditions with the minimum of visibility. During the last war the signal light problem claimed attention, and many signals had special hoods mounted over the lamps in an endeavour to reduce their visibility, but how far this succeeded we are unaware. Colour-light signals, if left as they are, will certainly be more visible than oil lights, and be rendered all the more so by the surrounding gloom. In the Netherlands "black out," referred to in an editorial in our issue of June 4, special hoods were applied to electric semaphore signal lights, or the voltage was reduced. Inspectors reported that no train or station could be recognised from the air. An occasional red light was seen but did not allow the line to be localised with any accuracy. It will be very awkward for train working if signals have to be extinguished over large areas, and the scientific way of meeting the problem—provided the taxpayer will find the money—appears to be to instal continuous cab signalling everywhere and do away with the great majority of the fixed signals!

* * * *

Variations of the Standard Gauge

Before the war, the European Continental railways were built mainly to a standard of 1·44 metres which is 4 ft. 8$\frac{11}{16}$ in. and thus slightly wider than the standard 4 ft. 8$\frac{1}{2}$ in. of the British railways. As a result, when British rolling stock was used extensively on Continental lines during the war there was a tendency for the insides of wheel flanges to bind on the check rails at crossings and elsewhere. In recent years, however, Continental practice has been standardised at a width of 1·435 metres which is identical with the British standard, although enquiries which we still receive make it obvious that this fact is not generally appreciated. In earlier years of railway practice slight variations from the standard gauge were quite common in the United States. Certain American railways were built to a gauge of 4 ft. 10 in., in some cases apparently with the express intention of preventing through running. It was found, however, that, by using a wheel with a broad tread, wagons might safely run over both gauges and as the 4 ft. 10 in. railways were chiefly in Ohio through which most of the extensive traffic between the east and west necessarily passed, a very large proportion of the vehicles intended for through traffic was provided with such wheels. After the American Civil War most of the railways with wider gauges were reduced, some to standard, and some to 4 ft. 9 in., and some to 4 ft. 9$\frac{1}{4}$ in., and by the beginning of 1878 *The Railways News* was able to record that broad-tread wheels seemed likely to disappear. At that time the New York Central & Hudson River Railroad had already given orders to have all renewals made with narrow-tread wheels which were, of course, lighter and cheaper than those with broad treads.

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Firebox Materials in India

In the discussion which followed the reading of a paper entitled "Boiler Proportions and Design" at a meeting of the Indian and Eastern Centre of the Institution of Locomotive Engineers, reference was made to the subject of copper and steel fireboxes for locomotives. Mr. J. M. D. Wrench, who has had considerable experience of locomotive operation in India, said that in that country copper boxes gave less trouble than riveted steel ones when fitted in narrow grate boilers, but were unsuitable for wide grate boilers with combustion chambers. The reason for this appeared to be due to the greater co-efficient of expansion of copper, and, in the case of boxes with crown plates in excess of 7 to 8 ft. long, welded steel boxes were preferable. The copper fireboxes fitted in the more modern I.R.S. boilers with wide grates and combustion chambers had given trouble due to cracks developing in the top radius of the tubeplate. This was attributed to the sling stays providing inadequate support due to the upward movement of the box under heat, and they had since been replaced by short girder stays which had minimised but not entirely overcome the trouble. Mr. W. A. Stanier who was present at the meeting, in summing up the discussion confirmed some of Mr. Wrench's remarks, and said that in his experience steel inner fireboxes if of the narrow type, were almost bound to give trouble but they gave satisfactory service when fitted to wide type fireboxes.

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English Spoken Here

The rule that the English language must be used by staff in the G.W.R. Central Wales Division in carrying out their duties, does not strike us as imposing much hardship on the bilingual native. It is, after all, only his relatively arid official emotions and desires that he is required to clothe in despised Anglo-Saxon. Should some such unforseen mishap as a portmanteau on his toe or a twopenny tip appeal to his deeper-seated passions, we do not suppose that any rule on earth would suffice to stem a bardic soliloquy. It is not likely that the visitor to Wales will miss anything in local colour during his train journeys. Such railway conversations as come to his ears in England or Wales usually strike him as being conducted by means of various inflections of the vowel sounds "ah" and "ooh," with an occasional "oi!" thrown in by way of admonition or warning. And whatever disputes may arise over the spoken word, the written word remains. Wales will preserve her station nameboards, the mainstay of the comic picture postcard industry and a solace to sufferers from the local licensing laws.

XUM

Rhodesia and Mashonaland Railways

SINCE the close of the financial year ended September 30, 1936, the undertaking and assets of the Mashonaland Railway Co. Ltd. have been taken over by Rhodesia Railways Limited, which had previously worked the lines of the Mashonaland Company. Separate reports of the two companies have been published for the year ended September 30, 1936, but the latest Mashonaland report, though showing the receipts and expenditure, gives no statistical or traffic information. Gross revenue of the Rhodesia Railways for the year under review showed a decrease of £28,972, or 1·23 per cent., due to the copper restriction scheme which affected the traffic requirements of the copper companies in Northern Rhodesia and the Belgian Congo. Working expenditure, including provision for depreciation and renewals, increased by £105,622, or 6·61 per cent., mainly because of the abolition of temporary reductions in salaries and wages and the resumption of payments to the Rhodesian staff pension fund on account of arrears of contributions. The surplus of gross revenue over working expenditure was therefore £134,594 less than in the previous year. After providing for debenture interest, &c., there was a profit for the year of £217,539, compared with £415,680 in the previous year. Of this profit the sum of £21,516 has been placed to the rates stabilisation account and £196,023 to reserve account, which now stands at £1,236,562. Gross receipts from the road motor services during the year amounted to £48,116, as compared with £47,657 in the previous year, resulting in a profit of £1,616 as compared with a loss of £784. For the first six months of the present financial year the combined working surplus of the Rhodesia and Mashonaland Railways shows an increase of £298,280. Operating figures of the Rhodesia Railways separately are compared herewith:—

	1935–36	1934–35
Miles open	1,518	1,518
Train-miles	3,158,372	2,953,480
Passengers	500,204	472,507
Tons, general goods	726,865	678,180
Tons, minerals	1,185,240	1,185,924
Operating ratio, per cent.	68	62·7
	£	£
Passenger receipts	278,345	262,673
General goods receipts	1,167,244	1,197,189
Mineral receipts	686,249	712,455
Gross revenue	2,348,744	2,377,716
Working expenditure	1,597,634	1,492,012
Surplus	751,110	885,704

Agreements have been concluded with the Government of the Union of South Africa and the Dominions Office acting on behalf of the Administration of the Bechuanaland Protectorate whereby the two Governments have agreed to postpone for 33⅓ years from January 12, 1937, the exercise of their right to expropriate at cost that part of the Rhodesia Railways system which extends from Vryburg in Cape Colony to Palapye in the Bechuanaland Protectorate, a distance of 357 miles. Further long term agreements have been concluded with Northern Rhodesia copper mining companies, which provide that these companies, in consideration of certain reductions in rates, to become operative on October 1, 1938, shall in respect of their present producing mines continue to consign all their overseas imports of materials and their exports of copper over the Rhodesian railway system from or to Beira or Mafeking up to September 30, 1956, that they shall not use hydro-electric power and shall take all their coal and coke requirements from the Wankie Colliery Co. Ltd. during the same period. These arrangements secure for nearly 20 years, upon satisfactory terms to the Rhodesian railway system traffics which are among the most important in Rhodesia. The accompanying table shows the results of the Mashonaland Railway Company during the past two financial years:—

	1935–36	1934–35
	£	£
Passenger receipts	64,234	63,942
Goods and mineral receipts	1,135,628	1,269,232
Gross revenue	1,288,453	1,413,877
Expenditure	922,156	920,604
Surplus	366,297	493,273

After meeting debenture interest and other charges the loss carried to the balance sheet is £100,364, compared with a profit of £925 for the previous year. The debenture stock conversion scheme and the acquisition of the Mashonaland Railway Co. Ltd. by Rhodesia Railways Limited is fully described in the Rhodesia Railways' report. The new arrangements as a whole will result in a considerable reduction in fixed charges and are expected materially to accelerate the dates upon which dividends can be paid and reductions of rates can be made for the benefit of railway users. The scheme was set out in THE RAILWAY GAZETTE of February 26 last, at page 394.

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London Transport Coronation Traffic

THE past four years have witnessed many occasions of large gatherings in London to celebrate events of special national and imperial interest. The wedding of the Duke and Duchess of Kent, in November, 1934, was followed by the period of festivities in connection with the Silver Jubilee of King George V, and all too soon afterwards the tremendous pilgrimage to his Lying-in-State. The same year in which the late King died was also marked by the unprecedented events in connection with the abdication of King Edward VIII followed by the accession proclamation of King George VI. In every case a wide measure of public interest or sympathy resulted in greatly increased traffic movements in the metropolis and more than once the word "record" was applied, not unjustly. A new standard of records, however, was set up by the persistence and intensity of the traffic movement around the West End of London between May 1 and the close of the Whitsun holiday on May 17 of the present year, and it will be recalled that the Underground railways were called upon to bear the brunt of this traffic owing to the coincidence of the London bus strike with the period of festivities. More than six months before the Coronation (when it was not even realised which King would be crowned) meetings began to take place between the departments concerned of the London Passenger Transport Board, and the Police authorities. Services were co-ordinated to deal with the traffic expected from the excursion trains of the main-line railway companies, and as a result of these meetings it was decided to operate all-night trains on Tuesday night, May 11, on a number of Underground lines. Incidentally, to facilitate the continuous working one train on every line was fitted with a powerful searchlight to enable the engineers to examine the track and equipment.

Many of the details of the successful handling of this record traffic are doubtless still fresh in the minds of a large number of our readers, and some of the chief facts and figures were placed on record in our columns at the time. The subject, however, of this period of unprecedented stress has been recalled to us by a handsome and well-produced brochure which has been compiled at the direction of Mr. J. P. Thomas, the General Manager of the London Passenger Transport Board's railways. Primarily it is intended to be a souvenir of a great occasion for the railway staff, but it has also its value as an historical document, and we are grateful to Mr. E. Rawdon

Smith, Public Relations Officer, of London Transport, for having presented us with a copy for inclusion in our library. This brochure is certainly worthy of the occasion and the purpose, and fully maintains the high standard which London Transport has set itself in the production of such documents. Although, as already mentioned, the whole movement covered a period of seventeen days, the greatest peak was of course Coronation Day. Actually, the traffic of this day began long before midnight struck, for during the normal return business peak on Tuesday, May 11, the first hardy all-nighters began to arrive to take up position along the curb, and train services on the Underground railways were maintained throughout the night of Tuesday—Wednesday and therefore continued to run without intermission for a period of 46 hours. During this time the board's trains ran 1¼ million miles and carried 5½ million passengers. The public did not lay aside the sight-seeing habit on the resumption of business on the following day, and Mr. J. P. Thomas feels that the actual test of the railway organisation and control was made by the heavy traffic on Thursday, Friday, and Saturday. The mounting tide of movement was as follows:—

Wednesday, May 12	2,600,000
Thursday, May 13	3,100,000
Friday, May 14	3,300,000
Saturday, May 15	3,000,000

In all 20 million passenger journeys were made on the board's railways during the week ended Saturday, May 15, and it is estimated that more than 60 per cent. of the traffic was composed of passengers from the provinces and overseas. Moreover, the proportion of children, cripples, and of aged persons was high, which made the traffic slow moving at stations and so forth. Underground trains ran 3,500,000 car miles during the Coronation week, escalators 20,000 miles, and lifts 11,000 miles. Electrical output from the two power houses and 64 substations was 14,500,000 units, and 9,500 tons of coal were used. The heaviest station traffic on the board's lines was at Victoria where an average of 77,000 passengers per diem was booked over one pair of tracks throughout the week—the number should be more than doubled, of course, to obtain the total figure of passengers handled. The brochure, which is generously illustrated with coloured maps, train recording dials, graphs, and a selection of photographic reproductions, is a valued memento of a great occasion. Included is a facsimile of the letter from Lord Ashfield which was received by every member of the staff expressing personal appreciation of the way in which the Underground men made possible such a magnificent achievement.

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Accidents to Platelayers

ACCIDENTS to railway employees working on the track are relatively infrequent and are mostly due either to disregard of rules and regulations or to fortuitous circumstances beyond the control of the officials in charge; the recent Annual Report of the Chief Inspecting Officer of Railways also indicates that conditions in this respect are improving. Nevertheless certain accidents have occurred lately which have revived the question of the best method of giving warning of the approach of trains. These accidents are a matter of great concern to the responsible railway officers, and any possibility of introducing a means of avoiding them is certain to be welcomed. The problem deserves the most careful consideration principally from a humanitarian point of view, though its economic aspect is not negligible, for delay, disorganisation of work and liability of compensation are all apt to arise. There is often a tendency, very natural in the circumstances, for coroners and juries to overlook the comprehensive regulations laid down for the protection of employees and to recommend that improved warning appliances and methods should be introduced. But whether it is possible to do so is precisely the question constantly before those concerned and one very difficult to answer. In several of these accidents the circumstances have been very similar; there is often the coincidence of a fast train on one track overtaking a slow one on another, to the accompaniment of smoke, steam and noise, leading to the faster train being overlooked.

The present regulations are quite clear. Rule 234 (d) says that "when work is about to be undertaken on or near lines in use for traffic and danger is likely to arise, the ganger, or man in charge, must . . . appoint one or more persons, as may be necessary, expressly to maintain a good look-out, and to give warning of any train approaching." These methods work well in normal conditions on an ordinary double line, but on quadruple or multiple-track lines there is obviously a greater element of danger, and anything unusual, such as an excessive amount of steam and smoke, when one train is overtaking another, tests these arrangements considerably. The view of the look-out man may be obscured, and it is admittedly then his plain duty to see that the men are clear of all possible danger. In practice there may be a time lag in realising the necessity, which may be fatal, for a train moving at 60 m.p.h. covers nearly 100 yd. in 3 seconds. This was apparent in the Bamfurlong accident of June 1, of which at present we have only the inquest report. Some facts were in dispute and the jury added a rider referring to speed restrictions, but we do not think this has anything to do with the essential principles of the problem. The Watford accident in 1932 and the Preston accident last year were both serious. Smoke and steam interrupted the view, and clause (a) of Rule 234 came under discussion. This orders that men must "at once move clear of all lines unless they can distinctly see that they are in a position of safety and in no danger from another train." On a busy line, however, this may be almost a counsel of perfection.

While it is easy to point to the causes of these accidents it is admittedly not as simple to suggest any really practical and effective improvement on the present methods of giving warning. The provision of additional look-outs is covered by the rules, as also are speed restrictions, but exceptional conditions are not met thus. The elimination of the human element by automatic warning apparatus, including portable treadle devices, has been proposed. As the actual warning signal must necessarily be an audible one it is impossible to construct it on the closed-circuit principle, whatever the actual setting circuit may be, and there is the fear that it might itself fail some day unexpectedly with disastrous consequences. Duplicate apparatus might, however, reduce such a risk practically to nothing. The L.M.S. Company is experimenting with a new type of Klaxon horn, and the German State Railway is known to use the Tyfon whistle, which is stated to be very effective, but if manually worked the problem of the look-out man's view being obstructed by smoke still remains. It is possible to imagine several forms of automatic arrangement, or apparatus set in action say, by short wave wireless, from some neighbouring signal box, and many such have, no doubt, been proposed to, and considered by, the railway companies. No apparatus that we have yet heard of appears to meet every dangerous possibility, but the problem is, we suggest, of sufficient importance to be made a subject for report and discussion at the next International Railway Congress, to be held in Berlin in 1941.

XUM

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Travel Amenities

The Railway Club, E.C.4, August 21

To the Editor of The Railway Gazette

Sir,—Your comment on Mr. Johnston's letter regarding the placing of timetables in public positions, is very apt. It would seem that the companies, too, have discovered that honesty is not universal, and, so afraid are they that even the sheet timetables will be removed, that seats are placed in front of them whenever possible so that intending maldoers (and passengers) shall find access thereto well nigh impossible.

Yours faithfully,

PRECURSOR

99, Clifton Road, S.E.25

August 21

To the Editor of The Railway Gazette

Sir,—If I may venture a very brief reply to the editorial criticisms appended to my letter of August 7, mature reflection or, better, actual experiment would, I think, speedily convince the railways that none of the objections advanced against the proposals in question need be deemed insuperable. Timetables could be secured against theft with massive chains, like the bibles in mediæval churches; whilst seats in the corridors could be kept locked up to the side so long as accommodation was available elsewhere, or whenever their use seemed likely to menace communications along the train—if, indeed, those fortunate enough to have found room in the compartments could reasonably object to a little inconvenience in the corridors.

But surely there is no reason to fear that passengers disposed on unobtrusive tip-up seats would prove any more obstructive than if standing, or sitting on their suit-cases as they often do. What matter, too, if an occasional timetable should go astray? Surely anyone enthusiastic enough to run the gauntlet of ticket-collector and other station officials with such a ponderous trophy must be an apostle whose interest in their system the railways would do well to conserve and encourage.

Again, the publication of brief notes indicating the various routes and their comparative advantages at different times of day might be the means of saving travellers much time and trouble without involving the railway companies in any guarantee, since nothing need be given beyond an indication of the various possibilities (often very difficult for the inexpert to unearth for themselves) and of the sections in *Bradshaw* most likely to satisfy any particular requirement. When it is remembered how very mediocre are the majority of local A.B.C. guides, it may well be wondered whether the railway companies are wise to leave such a function entirely to local enterprise without at least a supplementary service of the kind suggested above.

Yours faithfully,

K. H. JOHNSTON

Classes in Railway Signal Engineering

East Indian Railway, July 21

To the Editor of The Railway Gazette

Sir,—In your issue for June 6, 1937, you refer to training in signal and telegraph maintenance and suggest that a course of railway signal engineering was professed at one technical college before the war. You may have in mind some classes held in the Royal Technical College, Glasgow. The lecturer was Mr. L. P. Lewis, of the Caledonian—later the L.M.S.—Railway. The classes, to my knowledge, were existing in 1918 and for a year or two afterwards and were very successful, being attended by railwaymen of all grades, some travelling long distances to be present. Mr. Lewis made the lectures most attractive, and had numerous working models, of which he was justifiably proud. Although a lecture was scheduled to last one hour, so great was the interest taken by students that informal discussions were invariably held round the model table long after its conclusion. I cannot now recollect the reason for the discontinuance of the classes, which were undoubtedly of great value to all who were privileged to attend them.

Yours faithfully,

J. N. MACMILLAN

[It was Mr. L. P. Lewis's classes that we had in mind, and we are glad to hear they were so much appreciated. Mr. Lewis is the author of an excellent textbook on mechanical signal engineering, the third edition of which, revised by Mr. J. H. Fraser, now Assistant Signal and Telegraph Engineer (Northern Area), L.N.E.R., was reviewed in our issue for January 13, 1933.—Ed. *R.G.*]

Firing Locomotives Electrically

35, Croydon Road, Middlesbrough

August 16

To the Editor of The Railway Gazette

Sir,—In these days of electric steel furnaces and household cookers, I am wondering whether any experiments have ever been made in the use of electricity for firing locomotives. It is difficult to justify the electrification of main-line railways when the consequence is the sacrifice of a valuable fleet of engines and the building of very expensive electric units. If, however, some form of electric heating apparatus could be fitted, without too extensive alterations, to the fireboxes of existing engines, the question of scrapping them would not arise.

Between the steam system and the all-electric system you would, in fact, insert a transitional system during which steam engines, electrically fired, would continue to be used for the full course of their normal life, but all replacements would be all-electric units. During this period, it would be immediately possible to realise many of the advantages of complete electrification. For instance:—

1.—The coal bill would be reduced.
2.—The carriage of coal would be simplified and reduced.
3.—Shed duties would be simplified and lightened.
4.—The fireman's duties would be lightened.
5.—The smoke nuisance would be abated.

And so on. But has it been tried?

Yours faithfully,

C. A. HAYGREEN

[The proposal would certainly secure the last four advantages suggested, but would not reduce the coal bill. On the contrary, the heat energy supplied to the steam, instead of being obtained at, say, 70 per cent. efficiency direct from locomotive coal, would be debited with the inefficiency of the powerhouse. One lb. of coal burnt at the powerhouse could not give more than about 20 per cent. of its heating value to the steam in the locomotive, whereas the same quantity burnt in a conventional locomotive boiler may give 70 per cent. In both these cases the efficiency of the engine must be considered. The ordinary steam locomotive engine can be credited with about 10 per cent. thermal efficiency, so that its overall efficiency (coal to tractive effort) is about 7 per cent., whereas the suggested scheme would have an overall efficiency of only about 2 per cent. On the other hand the electric locomotive has an efficiency (electricity to tractive effort) of, say, 80 per cent. Thus, combined with a powerhouse to locomotive efficiency of 20 per cent., the overall efficiency of the straight electric locomotive is about 16 per cent. In other words the proposed scheme would use about eight times the amount of coal that would be required by complete electrification. To this debit must be added the capital charges of electrifying the track and of providing the electrical heating elements, with their controls, plus the necessary alterations to the firebox. The weight of coal hauled by the locomotive would be saved, but tenders would still be necessary for water supplies.—Ed. *R.G.*]

PUBLICATIONS RECEIVED

Steel of Empire.—We are advised by the Phœnix Book Co. Ltd., of Chandos Place, Charing Cross Road, W.C.2, that this publication, formerly selling at 21s., is now available at 7s. 6d. (8s. 6d. post free). We reviewed this illustrated account of the conception, prospecting and construction, and subsequent history of the Canadian Pacific Railway in our issue of November 8, 1935.

The Western Land. A. K. Hamilton Jenkin. Published by the Great Western Railway, Paddington station, London, W.2.—The author has managed to compress into this small book on Cornwall a great deal of entertainment as well as information. The first thing he impresses on us is that Cornwall is *not* England. The Cornish people, like the Welsh, are Celts, with an admixture in their blood of a still older race. The Celts left, above all in importance, their language, which survives today in dialect words and place-names. An indication of the variety of subjects dealt with is given in some of the page headings—Cornish saints ; tin and fish ; the moors ; relics of the past ; Lyonesse; the Zennor Mermaid ; the Cornish language ; and so on. Cornish legends, too, have a place in this publication—including the tale of the lady dressed in white and with a rose in her mouth, who every Christmas morning appears at the entrance to the Pendeen *Vau* (cave) bringing news from Ireland !

Elsners Taschenbuch für den Werkstätten- und Betriebsmaschinendienst bei der Deutschen Reichsbahn (Elsner's Pocket Book for Workshops and Running Sheds on the German State Railway). Berlin, S. 42, 1937 : Otto Elsner Verlagsgesellschaft, 585 pages, 4 in. × 6¼ in. 150 figures. as well as numerous engineering tables, specimen official forms, supplementary diagrams, specifications etc. Price 3.50 R.M.—This pocket book, now in its second year of issue, covers more ground than the English rendering of the title suggests, owing to the different organisation of the railway service in Germany. There is nothing in English working corresponding exactly to the *Betriebsmaschinendienst*, which covers nearly all the technical side of operating work. German publications of this type are generally well produced, and the present one is no exception. After some preliminary definitions have been explained, welding is dealt with, and particulars are given of the various processes and types of equipment. Then follow a number of interesting details on the maintenance of locomotives ; their classification, taking over from the builders, etc. ; with examples of the various official forms used in the workshops, for reporting and organising repair operations and estimating costs.

The descriptions of the most important repair operations on cylinders, frames, motion, etc., are accompanied by useful illustrations of tools, and processes in course of execution, with toleration diagrams and tables.

Rolling-stock is treated in a similar manner, with works schedules, showing the entire range of repair operations on all types of vehicles. Special parts of equipment, such as steam heating, are dealt with in more detail. Particulars are given of the various premiums awarded to drivers for saving fuel, etc., and how they are calculated, and these are followed by a section treating the economics of locomotive running, the treatment of the boiler, and the steam fittings, and the supply, storage and use of materials of all kinds. The method of marking, numbering and classifying all the drawings used by the railway is also explained, and is followed by a sketch of the training of certain grades of technical staff. A supplement gives the list of signs used on all classes of electrical diagrams, both those of the International Electrotechnical Commission, and of the Reichsbahn itself.

A certain number of engineering tables complete this very complete, handy and useful publication. It is a pity that it is printed in the Gothic type, which, however much it may satisfy German patriotic feelings, lessens the value of a book like this outside Germany and aids in preventing German methods becoming known and appreciated as they deserve to be.

Forgings and Stampings.—We have received from Head, Wrightson & Co. Ltd., Thornaby-on-Tees, an illustrated folder drawing attention to the firm's specialised facilities for the production of stampings and forgings of all types required in transport, and particularly adapted to withstand the stresses of high-speed service. A pile of railway screw couplings forms the cover design. Other illustrations of forged parts, which are produced in carbon steel and special alloys, show components for general railway and automobile engineering purposes.

Aluminium Products.—An illustrated photogravure booklet has been published by the British Aluminium Co. Ltd., Adelaide House, London, E.C.4, showing stages in the production of aluminium goods at the company's works. The early pages, after a sight of the raw material stacked ready to be worked into various forms or used for casting, alloying, and other purposes, give some impression of aluminium materials as supplied for use. The mills that produce the aluminium sheet and strip are the subject of an interesting double-page. Finally, there are representative illustrations of aluminium sections, finished components, wire and joints for overhead transmission lines, and screws and rivets. On the back cover are reproduced two views of picturesquely situated works of the company—at Lochaber, and Kinlochleven. Altogether, there are seven producing establishments of the British Aluminium Company in Great Britain and Northern Ireland.

From Dog Sleds to Air-Conditioned Trains.—We have received from the Canadian Pacific Railway a copy of a child's pictorial history of the C.P.R. entitled " From Dog-Sleds to Air-conditioned Trains." The publication is in the form of a light and handy booklet, coloured in robin-egg blue, and black, and is for free distribution to children travelling on the company's trains across Canada.

Couplings for Copper and Other Tubes.—Simplifix Couplings Limited, 3, Victoria Street, London, S.W.1, sends an illustrated leaflet showing various types of couplings for copper, Duralumin, steel, and tungum tubes. All the fittings have the Air Ministry's approval. Three types of union are shown, and also elbows, tees, Y-pieces, and four-way pieces. The Simplifix type of coupling comprises a nut, anti-friction collar, and a sealing ferrule.

Hardened Steel Rolls.—An illustrated catalogue of hardened steel finishing rolls for cold rolling steel, brass, copper, and other metals, reaches us from Hadfields Limited, of East Hecla and Hecla Works, Sheffield. In comparison with chilled iron rolls, hardened steel rolls have a greater intensity, depth, and uniformity of hardness. Also, the journals being harder, higher working pressures may be used and a superior finish achieved, with narrower limits of gauge on the finished products. Rolls are supplied in all types and sizes, the maker being prepared to assist users in making suitable selections for their particular purposes. In general, a steel of high carbon-chromium composition is used in the manufacture of the fully hardened rolls, the proportions varying according to circumstances. For semi-hard steel rolls a nickel-chromium steel is generally used.

Vacuum Pipe Line Installations.—The equipment described in this illustrated folder from W. Edwards & Co., Allendale Works, Vaughan Road, Loughboro' Junction, London, S.E.5, is the electrical alternative to the use of water jet pumps for providing vacuum service in laboratories. The system embodies a central motor-driven vacuum pump serving a pipe line to which a number of vacuum cocks may be fitted—normally twelve with the small size of unit supplied and twenty-four with the larger. Apart from the economy of having a vacuum service independent of any connections with or demands upon the laboratory water supply, the electrical equipment is economical to run. The average cost of current an hour for such installations, serving several points, is one penny, whereas a single filter pump uses water to the value of 1½d. an hour.

THE SCRAP HEAP

On August 5 the mail train from Calcutta to Assam ran over a large bear while passing over a bridge. Three coaches were derailed and the train was delayed for four hours until a breakdown gang cleared the line.

* * *

HE TIED HIS TOOTH TO A TRAIN

James Morrissey, of Elkhorn, Wisconsin, had toothache. There was no dentist available, so Morrissey used a railway train as a cure. He fastened a 150 ft. twine to the train. The other end of the cord he fastened to his aching tooth. A friend held Morrissey as the train moved.—It worked.—*From the "Sunday Referee."*

* * *

IN MEMORY
OF THE
GIRL IN BLUE
KILLED BY TRAIN
DECEMBER 24, 1933
"UNKNOWN BUT NOT FORGOTTEN"

A pretty girl in her early twenties, with blue eyes and clothing to match, was killed by a train at Willoughby, Ohio, on Christmas Eve, 1933. No one identified her, so the citizens of that town erected a stone over her grave, bearing the above inscription.

* * *

Sir Edwin Landseer, the famous animal painter, had a faithful servitor, who, in his way, was almost as famous as his master. Correct use of the aspirate, however, was denied him. Sir Edwin said that when he travelled on the railway he never troubled about his luggage, as William, his servant, was most careful as to its safety, getting out at all the stations and junctions and enquiring, "How about them luggage?" "Well, what's it like?" usually said the guard. "Why," always replied William, "it's as black as hink with a Hell on it."

* * *

THE AUSTRIAN "KURSBUCH"

Many interesting facts about the Austrian Federal Railways timetable book, or *Kursbuch*, are given in a recent article by Dr. Emil Weinberg in the *Zeitung des Vereins*. The *Kursbuch* appears in two editions, the pocket one for inland services, and the ordinary, comprising some 1,400 pages, which contains a large amount of information on services outside Austria. They are not issued by the railway authorities but by the Postal Department, as part of the Federal Ministry of Commerce, which has its origin in the fact that at one time that department possessed the sole right to carry passengers against payment. The first time-book containing railway information appeared in 1851 as the *Österreichisches Postroutenbuch*, but ceased publication two years later. Private persons then issued one for a time called *Der Dampfer*, superseded by another published by the State, *Der Kondukteur*, the name being changed to its present one in 1902. Just before the war it was a comprehensive volume covering railway services over a large territory very different from the Austria of today. The latter is nevertheless a transit ground for a large number of important international routes, making it necessary to issue a time-book covering a much larger area than is served by the Austrian railway system alone, services in Czechoslovakia, Hungary, Jugoslavia, Italy, Poland and Roumania being fully shown. Printing is done at the Austrian State press on special machinery. The inland edition is distributed through newsagents, the complete edition being sent to stations, post offices, tourist and information offices, and exchanged with the management of neighbouring railway systems.

* * *

The ancient goblet known as the Luck of Eden Hall which is on loan to the Victoria and Albert Museum, has been in the possession of the Musgrave family for hundreds of years. There is a legend attached to this old glass tumbler to the effect that "If that glass should break or fall, Farewell the luck of Eden Hall." Eden Hall has a railway interest, for when the old Midland Railway directors proposed to run their Settle and Carlisle line through about four miles of Sir Richard Musgrave's land, the baronet was strenuously opposed to such an intrusion on his property, but eventually he became an enthusiastic supporter of the scheme. Passengers by that route to Carlisle and Scotland will doubtless have often caught a glimpse of Eden Hall in its beautifully-wooded grounds.

* * *

RAILWAY SPEEDS IN 1838.

The following extract from the *Morning Chronicle* of May 19, 1838, is not without interest to students of railway speeds:—"The extreme rapidity of railroad travelling, was perhaps strikingly exemplified on Saturday, on the London & Southampton line. An engine was appointed to follow the train which conveyed the directors and their friends, and in going, as it went almost immediately after the train, of course it could not go faster than the train; but in returning, it was found that this engine would not be wanted, and it remained at the end of the line, as far as it is at present opened, two hours after the carriages with the directors had started. This engine then proceeded to London, and it accomplished the entire distance of 23 miles in no longer a time than 25 minutes, stopping once by the way to take up a passenger, so that it may be said to have travelled at the rate of very nearly sixty miles per hour. We do not believe that an instance of greater rapidity is on record."

G.W.R. Staff Association Fête at Oxford

The Hon. A. Windham Baldwin and Sir W. James Thomas, Directors of the Great Western Railway Company, acting as judges in the ankle competition for ladies last Saturday

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

BRAZIL

Mogyana Railway: 1936 Results

The annual general meeting of this railway was held on June 10; the results of the previous year's working were as follow: Receipts totalled 53,675 contos of reis and expenses 39,340, compared with 47,587 and 36,616 contos for 1935. A total of 3,157,581 passengers was carried during the year, against 2,749,709 in 1935, the corresponding receipts being 10,617, and 8,587 contos respectively. Free transport was afforded to 5,057 immigrants, who otherwise would have paid 79 contos in fares. Luggage and parcels increased from 54,297 tons in 1935 to 61,312 tons, receipts improving from 3,057 contos to 3,166. Telegrams also improved in both numbers and receipts.

Animals registered a decrease of 8,327 head, and 12 contos in revenue, but general merchandise increased from 1,200,627 tons to 1,461,327, giving also an increase in receipts amounting to 4,416 contos of reis. Coffee tonnage fell by 2,420 tons, and receipts were 1,138 contos less.

Increased Operating Costs and Remedies

As a result of the "eight-hour law," in force since August 7, 1935, staff expenses had increased by 1,247 contos, and, in addition, material costs were higher by 1,477 contos, due, principally, to the greater consumption, and higher cost of fuel. Material in hand at the end of the year was valued at 7,253 contos.

With a view to reducing fuel costs, 920,000 eucalyptus trees were planted in the railway plantations, at the Mogyana and Casa Branca farms, making a total of 1,439,841 trees planted to date. Firewood to the value of 48 contos was cut during the year.

Road Competition

Road competition had become more pronounced, and the President, addressing the meeting, stated that definite measures to combat the evil were essential. The long chain of roadways from São Paulo to Riberão Preto, and França, with branches to Mogy-Guassú, Espirito Santo do Pinhal, São João da Bôa Vista, Poço de Caldas, Amparo, and Serra Negra, had seriously affected the railway's import and export traffic, and furthermore, the Ribeirão Preto-Orlandia road was also being extensively used. Numerous other cross-country roads placed the towns served by the railway in direct contact with the Paulista and São Paulo lines, as also with those of the Rêde Mineira de Viação, offering further facilities for the export of valuable traffic. The construction of three more roads, namely: (*a*) Orlandia to Igarapava, via São Joaquim, Ituverava and Guará; (*b*) Jundiahy to Amparo, via Itatiba; and (*c*) Bragança to Itapora, via Soccorro and Lyndoia, for which the State Government had already granted credits amounting to 13,500 contos, menaced the railway's position still further.

With a view to offering some resistance to this competition, a special Commercial Department had been formed in June. This department had already the organisation of rail-road services under review, and door-to-door collection and delivery services were being studied. Interchange traffic arrangements with other railways were well in hand, and the use of railcars and a speeding up of timetables, wherever possible, was under consideration.

SOUTH AFRICA

Durban Harbour Development

At a recent informal meeting between Mr. Pirow, Minister for Railways, and the Durban Chamber of Commerce, the latter body contended that, even with the completion of the two new deep water berths now under construction at the Point, there would still be an urgent need for further accommodation at the port. In support of that contention, the Chamber agreed to submit an analysis of the Durban harbour traffic, which, Mr. Pirow promised, should be considered in detail.

Reference was also made to the plans prepared by the railway administration for the construction of two new projecting wharves at the Point, which, as Mr. Pirow pointed out, were prepared in accordance with the set policy of the administration to investigate harbour development as many as ten years ahead; they were tentative and not necessarily definite proposals. The Chamber agreed that these wharves would meet the berthage requirements of the port for many years to come, and that the adoption of the plans would be in the best interests of Durban.

CEYLON

Unexpected Demand for More Cattle Trucks

In order to stimulate stock-breeding in the island, the Government has placed restrictions on the import of cattle and goats, with the result that large numbers of animals now move about the colony. As the present number of cattle trucks on the Government Railway is under 100, the administration has decided to build a new fleet of these vehicles to cope with the increased traffic. The new trucks are to have all the latest improvements, and additional loading and other facilities are also to be considered.

Through Goods Bookings from India

To encourage through goods traffic between Ceylon and Southern India, an agreement has been concluded between the South Indian, Madras & Southern Mahratta, and Ceylon Government Railways for through bookings from certain selected stations in particular Indian districts to Ceylon stations. Hitherto the difficulties of different currencies and methods of accounting have ruled out this procedure, but the scheme is now to be given a fair trial.

Attracting Passengers

Steps to encourage travel between India and Ceylon with the object of attracting more patronage to the railway are being taken on the initiative of the Ministry of Communications and Works. With a view to making such trips more attractive steamer facilities are being included for part of the journey with the co-operation of shipping agents. This experiment in making people more travel-minded is to be introduced for the present between Ceylon and certain States along the Malabar Coast in South India. The necessary arrangements have already been made by the South Indian Railway, the Ceylon Government Railway and the steamship companies concerned, all of which have come to an agreement with regard to the distribution of fares and the traffic.

ARGENTINA

Petition for Increased Tariffs: Companies Ask for Early Decision

Although over six months have elapsed since the four broad-gauge railways sent a petition to the Government for permission to increase their tariffs on certain classes of commodities, no reply has yet been given to this just and reasonable request. On July 14, a joint note, signed by Engineer Atanasio Iturbe, Dr. G. E. Leguizamon, and Dr. Luís P. O'Farrell, the Chairmen of the respective local boards of the Central Argentine, B.A.G.S., and B.A.W. and B.A.P. Railways, was presented to the Minister of Public Works, reiterating the strong claims of the companies to the Government's sympathetic consideration, and asking for an early and favourable reply. The note sets forth in the clearest and most convincing terms the present situation of the railways, pointing out that during the crisis the companies were asked to sacrifice their own interests by reducing their tariffs, in order to assist the national industries—and particularly agriculture—to tide over a period of economic depression and extremely low prices. To this appeal the railways responded without complaint, recognising the necessities of a situation over

which the Government had no control, and appreciating that, having linked their fortunes with those of the country, they took the same chances. Now, however, although the country is experiencing a boom, marked by record export figures and extraordinarily high prices for grain and other products, the railways are prevented from receiving their rightful share of the national prosperity owing to being unable to raise their tariffs on the carriage of certain commodities to a rate which these are well able to bear. The note also calls attention to the increase in the working expenses due to the rise in the price of fuel and other materials, and to the continued losses on exchange, owing to the devalorisation of the peso.

Further Concessions on Cordoba Central Railway

As reported in THE RAILWAY GAZETTE of August 13, the wage cuts on this railway have been suspended by Government Decree from June 1 to September 30, the extra expense being borne by the Government, while the Bill authorising the purchase of the line by the State is before Congress. This concession did not, however, include the personnel of the workshops, stores, or permanent way sections, who had been put on short time in lieu of wage deductions, and therefore did not benefit by the Decree. As this caused much dissatisfaction and gave rise to numerous protests, the company's representatives, after a conference with the Minister of Public Works, agreed to increase the working time on these sections by 6¾ hr. a week. This decision was communicated to the labour unions in a telegram from the Minister of Public Works, who urged the men to desist from any further actions tending to perturb normal working, and warned them that any further agitation of this sort would be dealt with in a way prejudicial to themselves.

Suspension of Wage Deductions on Entre Rios and Argentine N.E.R.

During the month of July, a short-lived strike occurred on the Entre Rios & Argentine N.E. Railways, when a section of the employees, emulating the action of their confrères on the Cordoba Central Railway, recorded in these columns, began obstructive tactics, with a view to compelling the railway administration to cancel the wage-cuts that had been in force for the last year or two. The movement began on July 15, when train working was suspended from 7.30 a.m. to 8.30 a.m., it being the avowed intention of the men gradually to prolong this period on succeeding days until their demands were granted. As rumours were current that the agitators were aiming at organising a general strike if their demands were not complied with, the Minister of Public Works (Dr. M. R. Alvarado) called a conference of the companies affected, at which, after discussion, the representatives of the railways agreed to suspend the salary and wage deductions until the accounts for the last financial year had been examined and the receipts verified. On this decision being made known, the strike was immediately called off. It is stated, however, that the majority of the men are by no means satisfied with this provisional arrangement, and are demanding that the deductions be cancelled for good.

Signal Engineers : South American Branch

[In our issue of July 30 a paragraph headed " Institution of Railway Signal Engineers (South American Branch)" erroneously gave Mr. Proud's designation as Chairman, instead of President, of the parent institution, and did not make it clear that the paper read on his behalf was his inaugural address to that body delivered in London in February last.—ED. *R.G.*]

UNITED STATES

New Streamlined Diesel Trains

Two of the latest diesel-electric streamlined trains now nearing completion are the City of Los Angeles, jointly owned by the Chicago & North Western and Union Pacific Railroads, and the City of San Francisco, jointly owned by the Chicago & North Western, Union Pacific, and Southern Pacific roads. In both cases the locomotives are of three units, each housing two 900-h.p. diesel engines direct-coupled with electric generators, giving a total h.p. of 5,400. So luxurious is the accommodation that though these trains are nearly 1,300 ft. in length they carry only 244 and 232 passengers respectively.

One of their principal features is sleeping cars of a new design suggested to the Pullman Company by Mr. W. A. Harriman, Chairman of the Union Pacific board. On each train is one of these new type cars, having five double and twelve single sleeping compartments. The latter are arranged in two tiers, upstairs and downstairs bedrooms each having sufficient headroom for a passenger to stand erect, and each room or compartment has toilet facilities. For day use these cars become private lounges. Two other sleeping cars in each train have four compartments and three drawing rooms, and each of the latter has an enclosed lavatory, toilet, and clothes locker. For night use these drawing rooms have both upper and lower berths, and a folding bed, as seen in three of the illustrations on page 356.

Roomette Cars

Articulated with one of the drawing room cars on the City of Los Angeles is a roomette car, with 14 single compartments, each with a let-down bed from the wall, lounge chair, and folding compartment seat, as well as toilet facilities. Behind the roomette car is the second drawing room car, articulated with which is a 12-section open type sleeper, with abnormally large berths, which are, in fact, standardised throughout these trains. Two other sleeping cars on the City of Los Angeles will have 11 bedrooms, and 12 enclosed sections respectively; the bedrooms have two berths.

The dining car arrangements consist of two articulated cars with two dining saloons and a kitchen between them. One dining saloon will seat 72 passengers, but the other is of the buffet type, seating 32. On the City of Los Angeles there will also be two chair cars, and on the City of San Francisco one. The two former are 72 ft. long and seat 52 persons each, and the latter is 84 ft. in length, seating 54; reclining revolving chairs are fitted. There is an observation car at the end of each train complete with cocktail bar, barber's shop, and accommodation for a stewardess, who will be a trained nurse. The stewards are accommodated in a dormitory-club car behind the dining cars.

Other Special Features

Fog-proof clear-view windows are a new speciality of these trains, as are also their dental lavatories, with foot pedals to enable passengers to use both hands for denture cleaning. Sanitary pillow storage lockers, hand baggage lockers, new air-conditioning and lighting systems, electric plugs for razors, curling irons, &c., are other special features of these luxurious trains, in which every compartment also has a radio plug. Every upper berth has a large double window, and on each train there are two telephone systems, one for use between the driver and train crew, and the other between the various public saloons. A new type of combined steam and electric train heating is installed, so arranged that either or both may be used, and is controllable in each compartment or saloon. The exterior livery is canary yellow and brown in both trains.

NEWFOUNDLAND

The Government Railway First Surplus for 14 Years

This 740-mile 3-ft. 6-in. gauge system, which links its headquarters, St. John's, with the north-west, west, and south-west coasts of the island, came completely under Government control in 1923, since when it has been worked at a loss. In the year ended June 30, 1931, the deficit amounted to £142,000, but on the same date in 1934 the deficit—during the first fiscal year then ended under the then new Commission of Government—was reduced to £27,400. Two years later the shortfall had dropped to £8,500. For the six months ended December 31 last, however, there was a working profit of £19,371. Though operating expenditure and outlay are expected to be higher this year, a small surplus is anticipated.

RECONDITIONING POINTS AND CROSSINGS ON THE BURMA RAILWAYS

Details of the experience gained and work done, also the saving of cost effected

IN August, 1935, the reconditioning of crossings was begun experimentally, the crossings being taken from the scrap heap and a portable welding set used in the engineering workshop. This early experimental work showed that in addition to building up worn rail tables, the crossings needed a good deal of subsidiary attention in the nature of truing up of worn bolt holes, replacement of damaged bolts, &c., so it was decided to do all this work in shops where adequate supervision was available. Having decided on shop work in preference to *in situ* work, the administration then installed a 3-operator mains transformer set which very considerably cheapened the current costs. Experimental work was also begun on the reconditioning of worn and damaged switch blades with such good results that this is now done as part of the regular routine.

A great deal of assistance was available in the form of various articles published on the reconditioning of crossings, but there was a marked paucity of articles dealing with switches, so the staff had to learn by their own experience. For the purpose of reconditioning, the crossing body, consisting of frog, wing rails, distance blocks and chairs, is treated as a unit, and a pair of switch blades, with their stock rails and heel blocks, as another unit.

A crossing unit sent in for overhaul is first completely stripped and examined, bolt holes are trued up and new bolts provided. The work-hardened skin is ground off and the crossing then temporarily assembled and weld metal deposited on the worn frog and wing rails. The frog is then surfaced on a bench grinder, on which the work is mechanically fed under a fixed grinder; this produces an accurate surface. The wings are separately ground with a portable grinder. The crossing is then finally assembled, and the final profiling of the rail tables is done by portable grinders using templates to get the correct profiles and wing ramps.

In the case of switch blades, a copper plate is clamped to the stock rail side of the blade and the weld metal deposited against it till the full height of metal is obtained with an allowance for grinding. The copper plate is then removed and weld metal deposited on the inner face of the blade. The inner face is then planed to fit its stock rail while the outer face is ground to profile with a portable grinder.

Microscopic Examination

In the earlier experimental work, the Rangoon University authorities were of great assistance in doing microscopic examinations of various specimens from which very useful data were obtained, first, to show the depth to which the old skin had to be removed before welding—this proved to be about $\frac{1}{8}$ in.—and secondly to show the results of pre-heating and post-heating of the work. As a result of these investigations, both pre-heating and post-heating have been given up with medium carbon rails, but with chrome steel rails post-heating is being continued.

There is a decided tendency for the frog, especially in the lighter sections of rails, to buckle with the cooling of weld metal on the head. Where this occurs, the frog is straightened in special cramps before going to the bench grinder.

When the overhaul of crossings or switches has been completed, each unit is stamped with a serial number and is examined by a Gazetted Officer who further stamps it with his pass mark before it is issued for use in the line. The serial number of the unit is then entered in a register which gives full details of the work done on the unit, number and type of electrode used and date of completion. The permanent way inspector receiving the unit informs the shops of the date and place it is put into the track, and this information is also registered. In the event of the failure of any unit, it is returned to shops for examination and an entry as to the cause of failure is made.

Up to date 350 crossing units and 200 switch units have been reconditioned. There have been 14 failures on crossings and only one switch blade has failed. Of the crossing failures, ten were due to the use of an unsuitable electrode, three due to faulty welding in the early stages, and one was due to the old metal not being ground away deep enough. The failure of the switch blade was due to a crack which escaped detection when the welding was done.

Electrodes and Cost

At present three makes of electrodes are in general use for crossings with Brinell hardnesses varying from 250 to 400, but for switches a softer electrode having a Brinell hardness of about 200 to 220 has been found more suitable.

The installation of the transformer welder has brought down the cost of reconditioning of switches from Rs. 30 (£2 5s.) a unit to Rs. 22/10 (£1 17s. 6d.), and crossings from Rs. 40 (£3) to Rs. 29 (£2 3s. 6d.). The reconditioning of crossings up to date has saved the administration some Rs. 83,000 (£6,225) with an expenditure of approximately Rs. 22,000 (£1,650) on new plant, the heaviest item being a new switch planer, on which all new requirements of points and crossings will, in future, be manufactured.

The Railways of Czechoslovakia

(*From a correspondent*)

THE Czechoslovak State Railways, with a route-mileage of 7,000, came into being in 1918, when parts of the Austrian and Hungarian systems were combined in their formation. With headquarters at Prague under the Ministry of Railways, it is divided into seven divisional managements centred upon Prague, Plzen, Hradec Králové, Brno, Olomous, Bratislava, and Kŏsice.

Formerly based upon Vienna and Budapest, the lines in this area catered mainly for a north-and-south flow of traffic, whereas the demands of the new State dictated a trend of traffic east and west, and the consequent reorganisation of the system. Groups of lines hitherto isolated nad also to be linked up, especially in the area comprising the eastern portion of the new State. This involved the construction of some 100 miles of new main line, and the doubling of another 125 miles. In connection with this doubling special mention must be made of the line from Břečlav to Bratislava, Czechoslovakia's main port on the Danube, which had become of outstanding importance in the country's export trade.

The State Railways are now run as an autonomous undertaking of the State, on purely business principles, under the Ministry of Railways, assisted by a board of 12

members, one of whom is a representative of the Ministry of Finance. This advisory board acts as an intermediary between the Minister and the executive side of the management.

In addition to ordinary working receipts, the State railway revenues are built up from taxes on rates and fares, 15 per cent. on the former and 20 per cent. on the latter. In 1928 these taxes totalled 682,000,000 Kč. (about £4,870,000). If revenues fail to cover operating expenses, short-term loans may be granted by the State Treasury, but surplus profits after setting aside percentages as reserve funds are payable to the Treasury.

Road, Electric, and Diesel Services

To reduce losses caused by road motor competition, the State Railways began to run road feeder services some years ago in areas where their lines are far apart, and in 1933 they also took over most of the bus services formerly run by the Postal Department and covering about 5,000 route miles.

Electrification has made little progress despite plentiful water power, due mainly to the richness of the country in good quality coal. Also, railcar services were instituted as long ago as 1924 and have proved very satisfactory, to the further exclusion of electric traction, which today is used on only about 30 route miles of line, wholly in the neighbourhood of Prague, the 1,500-V. d.c. system is used with overhead conductors.

The diesel services have replaced steam on lines where traffic is light, and more recently have been adopted for high-speed long-distance traffic. In 1935 the mileage covered by diesel units aggregated over 15,000,000. The principal centres served from Prague (Praha) by fast diesel units are Brno (Brunn), Bratislava (Pressburg), and Breclava. These services, provided by powerful diesel-electric railcars hauling three or four ordinary coaches, average 40 m.p.h. inclusive of stops. However, the great majority of railcar workings consists of light branch line trains hauled by four-wheeled vehicles. Large numbers of the cars use alcohol fuel.

Locomotives and Rolling Stock

As locomotives and rolling stock are built in large quantities in Czechoslovakia, those now in use on the State system are of modern types, and the following table shows the numbers at present in service:—

	Locomotives		Rail-	Coaching	Goods
	Steam	Electric	cars	vehicles	vehicles
State Railways ..	3,969	25	404	9,167	92,613
State worked Private lines*	203	1	13	299	3,597
Privately worked lines	37	8	81	138	490

* The most important privately-owned railway, the Kŏsice-Bohumm line, owns 178 engines, 173 coaching and 3,260 goods vehicles.

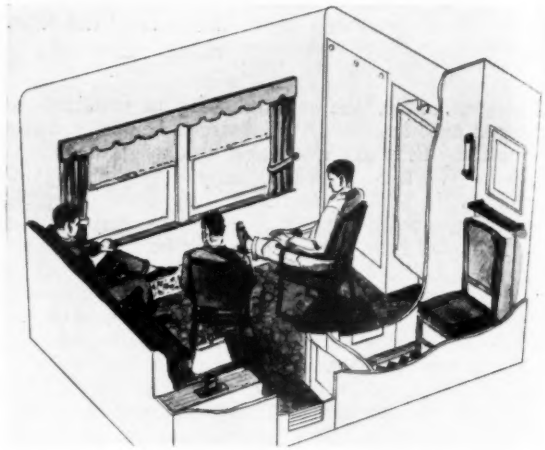
Politically Dictated and Tourist Traffic

Though the main flow of traffic is now east and west, the development of a north-and-south traffic with the other Little Entente States, Jugoslavia, and Roumania, is encouraged by specially reduced (by 40 per cent.) goods rates in the case of consignments from Czechoslovak stations to the Jugoslav ports of Split and Sušak, and to the Roumanian ports. Other facilities, both goods and passenger, also encourage this flow of traffic.

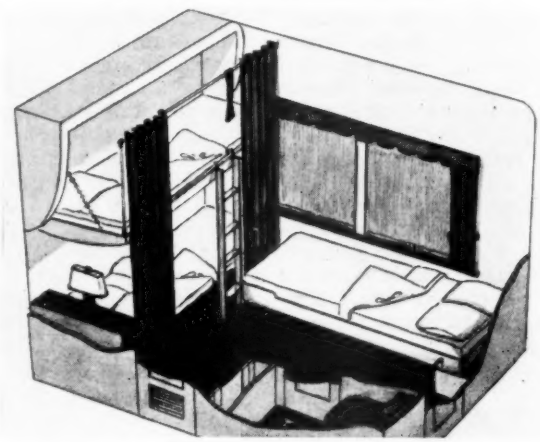
Between May and October each year, both inclusive, foreign visitors are offered a 50 per cent. reduction on the homeward fare after a six-days stay in Czechoslovakia, or a 66⅔ per cent. reduction after a 10-days stay at a spa in that country, and other means also are often taken to foster tourist traffic.

New Diesel Trains in the U.S.A.

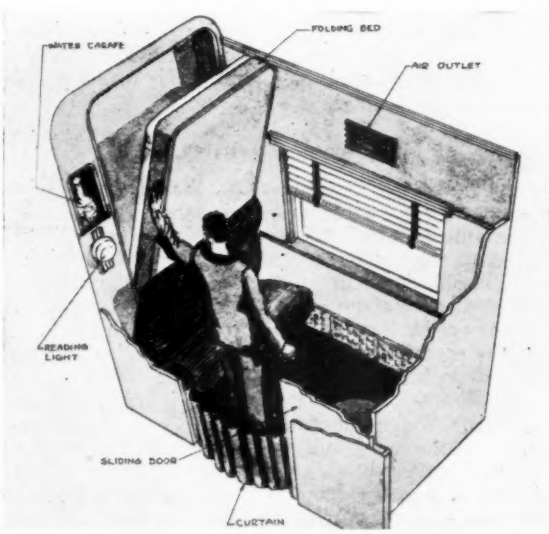
(*See description on page 354*)



Drawing room compartment by day



Drawing room converted for night use



Roomette being converted for night use

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Government Road Services for Travancore

THE Government of Travancore, in Southern India, has recently decided to establish road motor services broadly on the lines of those that have proved so successful in the State of Hyderabad, and as an initial step has appointed Mr. E. G. Salter of the Country Services Department of the London Passenger Transport Board as Superintendent of Road Transport. On taking up this new appointment, Mr. Salter recently severed his connection with the board's organisation at Reigate, and is at present arranging for the supply of the initial bus fleet from this country. An account of Mr. Salter's road transport career appears on page 372 of this issue. As already briefly recorded in our columns, an order was placed recently with Rootes Limited for 60 PNF3 (forward control) bus chassis equipped with Perkins diesel engines. Park Royal Coach Works Limited is supplying single deck 20-seat bus bodies for half-a-dozen of these, but we understand that it is the intention of the Travancore Government to build most of its bodies in works that it proposes to establish in connection with the Road Transport Department, although it is expected that chassis will continue to be ordered from this country. The Travancore Government owns 148 miles of metre gauge railway which, however, is worked on behalf of that Native State Government by the South Indian Railway Company.

Bean's Express Progress

ONE of the important subsidiaries of Carter, Paterson & Co. Ltd. is Bean's Express Limited, which now confines its activities to contract work. In the past this has been mainly in the London area, but at the present time the company is continually penetrating into more distant fields. The business of J. & F. Stone Limited, for example, extends over a very considerable part of England, and Bean's Express Limited has now arranged to supply and maintain vehicles for the firm in places as far distant as Sheffield, Hull, Manchester, and Derby, an arrangement that includes the provision of 17 additional vehicles. A similar contract has been made with Nobel Chemical Finishes Limited, for the supply of five vehicles working in the Birmingham area. Among new London contracts is one for Martin's Radio Limited, of St. John's Wood, for four cars to serve that company's eleven branches in London. During the Coronation period Bean's Express Limited was particularly busy making urgent deliveries of decorations and decorative materials; another important task at that time was to supply additional vehicles to Bladen Dairies Limited for the delivery of milk to the order of the Milk Marketing Board for the many thousands of children who attended the Coronation procession.

Gas Transport

CONSIDERABLE activity is being manifested just now in the adoption of gas fuel in place of petrol or oil for road transport of all kinds, and in the July 30 issue of this Section we described one of the modern producer-gas systems. Not unnaturally, it is the producer systems which seem to be favoured most, but vehicles running on town gas stored at high pressure in alloy steel cylinders are not unknown, especially for work which can be done within a short radius of the base, and such vehicles may be considered as in a direct line of development from the war-time gas-bag buses; at present their success is not so uniform as that of producer-gas units. Yet another system, the Erren hydrogen engine, is in the news just now. Despite being envisaged primarily for the use of hydrogen obtained by the electrolytic method, the Erren system allows either coal-gas or normal oil fuel to be used, and, indeed, the engine installed in the Erren demonstration bus is one of the well-known Beardmore oil engines. Hydrogen is stored in steel cylinders at a pressure of 3,000 lb. per sq. in., and, in contradistinction to producer-gas systems, the hydrogen is fed to the engine under pressure. In the producer-gas systems the favourite fuels are wood, charcoal, and anthracite, depending upon the particular conditions found in different countries. For example, in Germany it is thought that if wood or charcoal has to be purchased (and not used as a waste product)

One of the 16 Latil producer-gas buses recently ordered in France, to which we referred in our issue of July 30. The compact suction gas plant is arranged in the trunk at the rear of the body

it shows no economy over fuel oil, except for a certain reduction in the vehicle taxation. On the other hand, French users favour charcoal, partly as a result of the great afforestation work being carried out in France, and partly because of the availability of thoroughly reliable plants for this fuel, such as the Latil and Panhard. On the trans-Saharan route from Algeria to French Sudan both the passenger and freight vehicles burn this fuel, or wood, which is taken out and dumped at various points along the route. Similar vehicles are used extensively in Morocco and Tunis. Appreciable numbers of lorries having producers fed with anthracite or charcoal are in service in this country, and steps are being taken to make low-temperature coke a thoroughly suitable fuel. Blatant claims that producer-gas vehicles can be rebuilt easily from petrol units have unfortunately added considerably to the initial interest taken in such lorries and buses, and also to a certain amount of disfavour with which they are viewed, for while some rebuilds have been generally successful, the majority have not be able to give anything like the performance of a new vehicle designed for a producer-gas installation.

London Transport Canteens

AT the present time the London Passenger Transport Board is spending large sums of money on the provision of staff canteens, and by the end of the present year it is expected that 92 canteens will be in use, in addition to about 600 mess rooms. As we mention (on page 362) in the article on the new Northfleet garage, that depot is the first in the Country Services Department to be provided with a canteen. In the Central Area a modern canteen with accommodation for 50 men is a feature of the alterations and extensions now being carried out at Hackney (Well Street) garage. The contract for this, which has just been placed, completes the current programme, but plans are being prepared for more canteens in the next programme, and it is expected that the 100 mark will be passed in 1938. Incidentally, the Welfare Department of London Transport reports that there is a slow but steady response to the efforts being made to persuade the road staff to forgo in hot weather heavy dishes such as steak and kidney pie and suet pudding. Consumption of milk this summer is 7 per cent. higher.

Publications Received

Road Passenger Transport: Survey and Development. By R. Stuart Pilcher. London: Sir Isaac Pitman & Sons, Ltd., Parker Street, Kingsway, W.C.2. 8½ in. × 5½ in. × 1¼ in. 393 pp. Illustrated. Price 10s. 6d. net.—Passenger road transport, although a long-established industry, has very little traffic literature of its own apart from the proceedings of the various technical societies. Methods of operation have been evolved on empirical lines, and the newcomer to the industry has learned the rudiments of his subject by the severely practical procedure of beginning his business career in a subordinate capacity and imbibing the methods of his superiors. Of course, there have been notable exceptions, such as the large municipal transport systems, and the provincial associates of the British Electric Traction Co. Ltd., which, for many years past, have had machinery for the interchange of ideas and experience. This machinery, however, has been available only to senior officers, and the student has certainly not been offered excessive supplies of literature. The present volume has been written with a view to assisting the student to obtain a general knowledge of the subject, and its information is based largely on the author's experience in Manchester and other cities; he is, of course, widely known as the General Manager of the Manchester Corporation Transport Department. As such it is a welcome contribution to road transport literature, and doubtless students will appreciate the treatment, which starts with first principles and discusses all aspects of the subject as seen from the municipal viewpoint. Thus, successive chapters deal with general management; traffic management; finance; municipal and private operation; electric tramway developments; tramway abandonment and its effect on rates, taxation, and road maintenance; trolleybuses; motorbuses, and their garage equipment; diesel engines; the effect of suburban railway electrification; advertising; accident prevention; traffic congestion; joint transport boards; legislation; tramway parcels delivery; and technical inspection.

It should be emphasised, however, that the information given and views expressed are tinged throughout with the municipal viewpoint, and that the author recognises the existence of the large and increasingly important company-owned undertakings only in an incidental way, and often both with inaccuracy and unfairness. It must come as a surprise, for example, to any well-informed transport officer to be told that "the railway companies have used their powers to operate road transport . . . in the main by indirect methods by acquiring a controlling interest in most of the large omnibus companies." Presumably, most of our readers know how far from true this statement is, the position being, in fact, that the British main-line railway companies do not hold a controlling interest in a single bus company. The present volume, however, is written for students, and, therefore, it is the more regrettable that this false story should be given a further lease of life under the signature of so notable an author. The statement in another place that municipal transport has covered a period of 35 years is not a completely accurate remark, as, although 35 years probably covers the life of many municipal transport undertakings, there are notable pioneers (of which we believe Huddersfield to be the most ancient (who ran municipal tramway systems considerably earlier than the beginning of the present century. Furthermore, municipal transport surely includes ownership as well as operation, and the Tramways Act of 1870 envisaged the municipal ownership of tramways, which actually began about that time. Mr. Pilcher comments that the fares on most (municipal) undertakings are comparatively low, and as a rule are cheaper than the fares charged by private companies. We think he would find it difficult to substantiate the remark "as a rule" outside the special circumstances where protective fares have been granted to municipal undertakings. Again, Mr. Pilcher says, "a municipal undertaking has prestige and a reputation to maintain. The cars and buses must be reliable and punctual. Services have to be operated at all hours—whether remunerative or not—to suit the convenience of the public." These remarks apply, of course, to every large transport undertaking and are realised no less by the important railway-associated bus companies, and the implication that they are a peculiarity of municipal transport is one which we feel is entirely unmerited. Despite our criticisms of this municipal bias, the present volume is a notable addition to road transport literature, and is one which should find a ready appreciation among students.

The Bus and its Ancestors.—The London Passenger Transport Board has recently issued a set of photogravure postcards depicting London scenes from the late 18th century to the present day taken from contemporary illustrations, and at 6d. this set provides excellent value. The earliest is from a coloured lithograph of Dagarty showing the Hyde Park Corner tollgate and "traffic lights" about 1797, with an outward-bound Southampton coach and a stage wagon arriving. An engraving by Hogarth from the Victoria and Albert Museum of a country inn yard shows an early design of stage coach and the original form of roof travel with the alternative of the basket which passengers shared with the luggage. T. H. Shepherd's engraving of Charing Cross about 1830 is of particular interest, showing a Shillibeer-type bus and also a Blackheath stage coach with improved rear basket or boot. Eugène Lami's famous water-colour drawing from the Victoria and Albert Museum depicts Ludgate Circus about 1850 with knifeboard buses in a mid-Victorian traffic block that the present generation often forgets ever existed. More recent periods are shown by photographs of Piccadilly Circus in 1895 and 1937 respectively.

The Scottish Motor Traction Group—II

This part of the article deals with control and organisation; accounting; rail and road co-ordination; and vehicle overhaul

By R. BEVERIDGE, Commercial Manager, Scottish Motor Traction Co. Ltd.

AS will have been gathered from earlier remarks, the parent company of the S.M.T. group occupies the dual position of being the top company of the financial structure, and also one of the operating companies of the group. The S.M.T. directors are all on the boards of the other companies, but there the control ends. Apart from that, the respective company is on its own, and is entirely responsible for the traffic in its area. There are, however, frequent managers' meetings, under the chairmanship of Sir William Thomson who was the General Manager of the original S.M.T. when it came into existence in 1905, and who is now Chairman of the Board of each company. By means of these managers' meetings the general policy of the various companies is kept in line.

Internal Organisation

The internal control of each company is much the same. The area is divided into districts, each with its depot in an important traffic position. At each depot there is a district traffic superintendent and a depot foreman, both of whom are officially under the Traffic Manager and the Chief Engineer respectively.

The district traffic superintendent keeps in close touch with the traffic requirements in his area, and is responsible to the Traffic Manager for the conduct of his district. He has to see to the proper scheduling of duties, and report to the Traffic Manager on any improvements which he thinks can be effected in timetables and fare lists. To assist these district traffic superintendents, a weekly revenue statement is sent to them showing the earnings of every route in their district, and this statement also shows the corresponding week of the previous year. This enables them to see whether a route is improving or not, and whether there has been any undue fluctuation. The depot foreman is responsible for seeing that buses are kept clean and in good running order. Running repairs are carried out at each depot, but major repairs and overhauls are undertaken at the main depot in Edinburgh.

Drivers and conductors are controlled by the traffic department. Opinions throughout the country differ as to whether the drivers should be under the Chief Engineer or the Traffic Manager, and there are good arguments for both practices, but experience of both, leads me to favour their being under the Traffic Manager, as it eliminates much unnecessary internal correspondence.

The traffic inspectors are not under the district traffic superintendents, but are all under the chief inspector, who is stationed at headquarters and is responsible direct to the Traffic Manager. Some of these inspectors travel by bus, but others are taken round in small cars with a driver; this enables an efficient check to be made with the minimum number of inspectors. The timetable staff and the fares staff are stationed at headquarters, and of course they are guided by reports and suggestions which the district traffic superintendents send in to the Traffic Manager for consideration.

Accounting

The accounting department is controlled by the Secretary at headquarters, and his inspectors visit the various depots auditing all their books. Time cards from all depots, after being checked by the district traffic superintendent or depot foreman, are sent to headquarters where they are extended, and the information contained therein entered into a wages sheet which is typed in duplicate. These wages sheets are prepared in advance; every employee's name and number, and a note of the various deductions for insurance and so forth, are embossed on a plate which prints this information direct on to the wages sheet. The wages are then typed on to the sheet by means of a comptometer and totalled at the bottom of the sheet. One copy of this statement (which is perforated so that the portion relating to each man can be torn off) is sent to each depot with a cheque for the net amount of wages due. The cheque is cashed at the local branch of the company's bankers, and slips are torn off the wages sheets and placed in the employees wages tins with the proper amount of cash. When it comes to the last slip, the amount of cash left over should balance with the net amount of wages on that slip; consequently, the risk of pilfering is eliminated.

Fare Collection

The tendency to increase the length of routes has given rise to a very difficult problem with tickets. On one route we have as many as 81 fare stages, and our single fares vary from 1d. to 9s., with return fares varying from 3d. to 16s. Various methods have been adopted to reduce the number of tickets a conductor is required to carry. Stage numbers were adopted in place of stage names, thus enabling a ticket to be used on any route, but the tickets soon became too large, and the system of tickets printed with units and multiples of ten (which required to be punched twice) was then brought into use. Even this became so cumbersome as to necessitate in some cases 150 varieties of tickets being carried; consequently, after numerous experiments and trials, the S.M.T. adopted a ticket-issuing machine which prints on the ticket the day and month of the year; the stage at which the passenger joined the bus; the fare paid (in shillings and pence); and the number of the machine through which the ticket was issued. There are single and return tickets, and each bears a serial number, so that, by the aid of that serial number and the number of the ticket machine, it is possible quickly to ascertain which conductor issued any special ticket. Return tickets have spaces on the back indicating the hours of the day, the days of the month, and the month of the year. Punch marks are made in the proper spaces when the traveller makes the return journey.

Co-ordination

In accordance with the agreement between the S.M.T. Company and the L.M.S. & L.N.E. Railway Companies, a standing joint committee was set up, and latterly a sub-committee for each associated bus company. Any reductions in fares (either bus or rail) had in the first place to be agreed to by the standing joint committee. The last-mentioned committee also explored the possibilities of interavailability of tickets, and such an arrangement has now been in operation for the past eight years. Contact has also been made at many station yards, and suitable bus services have been arranged as feeders to railway excursions. Bus excursions have also been

arranged at a number of centres, as added attractions to railway excursions from the south, and no doubt other similar practices will gradually be introduced to the benefit of both forms of transport.

Overhaul Programme

Apart from the running repairs, which I have already mentioned, every vehicle has periodic overhauls based on mileage. The programme for this is as follows:—

Period	Mileage	Work to be done
1	15,000	Grind valves.
2	30,000	First light dock overhaul.
3	45,000	Grind valves.
4	60,000	Second light dock overhaul.
5	75,000	Grind valves.
6	90,000	Complete overhaul.

When a bus is in for a light dock overhaul the following is the routine:—

Engine.—All main bearings examined; all connecting rod bearings examined; pistons decarbonised and clearances checked; valves ground in; oil system examined; water circulating system examined for leaks; and holding down bolts examined.

Clutch.—Clearance checked, and clutch washed out.

Gearbox.—Cover removed; gears and selectors examined; casing tested for leaks; holding down bolts examined; and gearbox replenished with oil. In addition, all the road wheels are removed so that the bearings and brake rigging may be examined thoroughly. The steering gear is carefully examined and the wheels tested for alignment.

While the mechanics are engaged on this work the electrical squad checks over the entire electrical equipment, consisting of the dynamo, batteries, starter motor, regulator, wiring, switches, lamps, horn, windscreen wiper, conductor's bell, and Trafficators. In the case of petrol-engined vehicles, the magneto is cleaned and adjusted.

At the same time the coach works make a thorough inspection of the body, holding-down bolts, windows, seats, mudguards, flooring, upholstery, and emergency door fastenings.

In the complete overhaul the chassis is stripped; the engine, gearbox, and back axle are completely dismantled; and all parts are put through the degreasing plant. New pistons are fitted, the crank shaft is ground, all bearings are relined, and the whole chassis reassembled. New or reconditioned parts, are, of course, fitted wherever necessary. The same applies to the electrical equipment. The body work is all tightened up, and finally the vehicle is repainted.

Diesel Engines

The S.M.T. and its associated companies were among the first bus operators to take up the diesel engine, and they were certainly the first to adopt it wholeheartedly. At present fully 60 per cent. of the combined fleets are equipped with engines of that type. When the S.M.T. group first used diesel engines, the saving in fuel costs was considerable because there was no tax on fuel oil, while there was (and still is) a tax of 8d. a gallon on petrol. Even today the oil engine is the more economical because of the greater mileage per gallon secured from fuel oil as compared with petrol. Roughly, the miles per gallon are as 11 to 6 in favour of the diesel engine. If all commercial vehicles were fitted with diesel engines, the amount of fuel imported would be reduced very considerably, and in time of war this would be an exceedingly important matter; consequently, in the view of the present writer, the Government should give every encouragement to operators to use the diesel engine. Moreover, the risk of fire with the diesel engine is minimised.

Railhead Services in Ireland

(From our Irish correspondent)

THE establishment and maintenance of railhead road services on the Great Southern Railways have presented the company with many problems. As with any other railway company, the railhead services are designed primarily for the delivery of traffic conveyed to the railhead by rail, or for the collection of traffic to be conveyed to destination by rail, having in mind the retention of the traffic for the long journeys by railway. Direct road competition, however, restricts the amount which can be added to the railway rate, inasmuch as it must be considered in connection with the competing services between the source of supply and final destination; consequently the amount added and credited to the road portion of the journey will not necessarily prove an economic proposition if the traffic is to be retained to rail, and in many cases is an invisible reduction in the throughout rate.

Traffic of a perishable nature, such as sausages, fish, and fruit, must be delivered on the day of arrival at the railhead station, and even if there is not a load for the road vehicle it must still be sent with the perishable traffic, unless it is possible to have it delivered by messenger or local carrier. This difficulty is met to some extent by scheduling a service for such traffic on certain days only each week. The nature of the railway traffic has changed since 1914, and the present tendency of the trading community to obtain small orders more frequently does not assist full wagon loading or economic distribution.

Road services have enabled the company to close uneconomic branch lines, and this action may be extended as opportunity offers. The reasons that the change is not more rapid are the unsuitable conditions of roads, the nature of the traffic to be carried, and the capital costs entailed, together with the Government requirements in connection with substitute services. The problem of current costs is serious, and efforts to reduce them are naturally a source of intensive investigation. The distances which have to be traversed to collect or deliver traffic in most cases render motor conveyance necessary, but where possible an economy has been effected by using horse haulage; the cost of the latter is approximately one third the cost of the motor conveyance.

The hours of duty worked, the efficiency of the drivers, and the necessity for helpers, are all matters which are constantly under observation, but more satisfactory results would follow if the loading of the lorries could be increased and traffic secured for back loading. In the case of the railheads, the normal flow of traffic appears to be in one direction—that is delivery from the railway, with back loading usually meagre. Experience has shown, however, that an intimate knowledge of local conditions and existing markets generally, together with energetic organisation by the man on the spot, will enable him to take advantage of opportunities to create traffic by means of transport facilities hitherto operating within restricted areas. An example is provided by a district in which seaweed, shell fish, and marble offered the only scope for development. The agent at this particular point, taking advantage of the seasonal tendencies of supply and demand and by using the greater penetrative capacity of road vehicles, was able to induce prospective customers to initiate the development of the respective commodities at different times of the year and so afford a regular back loading to the railhead, which otherwise would have had very little, if any, such traffic in the outward rail direction.

Northfleet District Headquarters and Garage, London Transport

This recently-opened depot is one of the six central garages of the Country Services organisation. The garage, which has a capacity of about 85 buses and coaches, is the first for the London Transport green fleet to be provided with a canteen

WHEN the London Passenger Transport Board was formed in 1933, it was decided that the traffic operating and geographical conditions of its country area were so different from those of the congested central area that more efficient working would be achieved by the creation of a separate organisation. The nucleus of this was already in existence in the form of London General Country Services Limited, a subsidiary of the old L.G.O.C., which had headquarters at Reigate and was responsible for operations of bus services in a large ring outside the central area.

In certain respects, however, the outer ring assigned to the London Passenger Transport Board by its Act of 1933 was not identical with the territory previously served by London General Country Services Limited. Particularly was this the case in the South Eastern area, where a substantial tract of country in the neighbourhood of Dartford and Gravesend was taken over on July 1, 1933, from the Maidstone & District Motor Services Limited; in all 12 services and 63 vehicles were transferred. Furthermore, London Transport acquired the services of various independent local proprietors in the Gravesend district as follow:—

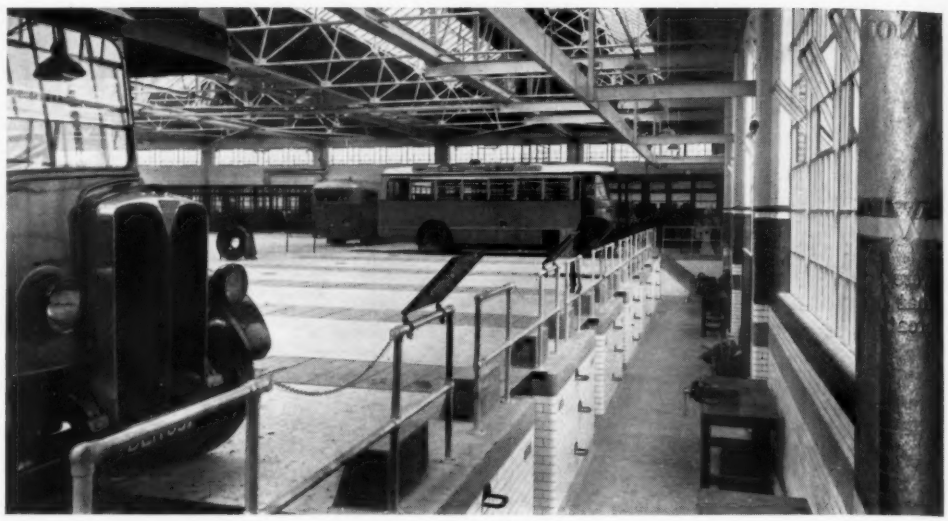
Operator	Date acquired
Enterprise Motor Service (H. D. Fletcher) ..	November 14, 1933.
Gravesend & District Bus Services Limited	October 1, 1933.
Greenhithe & District Bus Service (H. M. Howells)	April 18, 1934.
R. E. Hollands	January 17, 1934.
H. T. Molyneux	January 3, 1934.
Penfold & Brodie (W. E. Penfold) ..	February 21, 1934.

The area served by the Country Services section of London Transport is approximately the territory lying outside the limits of the Metropolitan Police area and comprises something like 1,294 square miles. As shown by the table on page 193 of our July 30 issue, the fleet of Country Services buses now totals 611, apart from 501 Green Line coaches which come under the same management. The management of this fleet is divided into six districts, and for running and maintenance purposes each district has a central garage located respectively at Romford, Hertford, Watford, Windsor, Reigate, and Northfleet. The largest garage is at Reigate, which has accommodation for 130 vehicles; that at Windsor runs it very close with a capacity for 120 units.

View from the London Road of the main entrance to Northfleet garage

Since the formation of the London Passenger Transport Board new garages have been built and old premises reconstructed in order that all buildings shall be as modern in planning and equipment as possible. Moreover, a particularly happy feature is that where new premises have been erected on conspicuous sites in country towns, the exterior design has been carried out with restraint, and with regard for appropriateness to the immediate surroundings. The most recent of these central garages to be completed is that at Northfleet which was opened on July 7. It covers an approximate area of 78,600 sq. ft., and has a capacity for about 85 buses.

As may be seen from one of the accompanying illustrations, the main entrance of the new Northfleet premises, on the London Road, has a wide approach road which leads to the garage. The main office block is on the right-



The large windows on the right of this view ensure good natural light to the six docking pits and communicating way at pit-floor level. A further aid to good visibility is the white tiling finish

hand side and consists of the traffic office and conductors' room on the ground floor, and a spacious canteen and kitchen on the second floor; the latter is reached by a Terazzo-finished stairway with ornamental brass railings. The canteen, which, incidentally, is the first to be operated by the board in its Country Services department, is furnished with standard tables, chairs, and other fittings, and provides seating accommodation for 40 persons. Meals can be obtained at popular prices.

The main entrance opens on to a large forecourt with cycle and motor cycle shelters on the right and left. On the left also are the district offices, washers' drying room, boiler house, and the heavy vacuum-plant. The District Engineer and District Superintendent have separate offices, and a general office is provided for their combined staffs. The boiler house, which is the largest and most up-to-date yet adopted in the Country Area, is equipped with a self-feeding coke-boiler thermostatically controlled.

An item of interest in the layout of the forecourt is the installation of decontamination points for the reconditioning of vehicles in the event of an aerial gas attack. The location of Gravesend on a main line of approach to London from the Continent makes such provision of particular interest at this garage, but we gather that such decontamination points are being adopted by London Transport at a number of key places.

Just within the entrance to the garage from the forecourt are installed the petrol and fuel-oil metering machines. These are internally illuminated and fitted with emergency motor-stopping devices. While buses are being fuelled and oiled it will be the practice to remove all used tickets and rubbish by means of the vacuum plant. The litter accumulated by a vehicle on service is drawn up and discharged direct into a receiver, which in turn drops it into an incinerator where the material is consumed. This method of cleaning the interior of buses marks a considerable advance over the old system

General interior view of the garage. On the left may be seen the petrol and fuel-oil metering pumps

of sweeping out by brushes, both from the point of view of convenience and hygiene. After leaving the fuelling points, buses are drawn into the washing bays and thoroughly washed externally by means of drop hoses fitted with specially designed nozzles. During non-washing hours, the hoses are raised to the roof, thereby eliminating obstruction. A washing-gantry has been installed so that the roofs and top panels of double-decked buses can be washed and repaired with expediency and safety.

The docking area faces the entrance doors. The garage has six docking pits connected by a communicating pit and all are finished in white tiling. The pits are illuminated by side electric lamps, and low pressure hand-leads are provided for use as necessary. In addition, the large windows ensure an abundance of natural light. The shops, stores, and offices are spacious, well equipped, and heated. Particular attention has been paid to the general illumination of the garage. In the bays, mercury discharge lamps are fitted and these are supplemented with 100-watt gas-filled units which act as a pilot system of lighting to be brought into use as required.

Railway Motor Services in Sweden

ROAD and rail transport co-ordination has grown steadily in the country districts of Sweden, particularly in those more remote parts of the country where, before the advent of the motor, the inhabitants were often completely isolated from any form of modern transport. In Great Britain it is only in such localities as north-western Sutherland and Wester Ross that villages may be found so far remote from the railway, but in Sweden they are quite common. A very considerable mileage is covered by the motor coaches of the Royal Mail Services and the Swedish State Railways in Norrbotten and Lapland. Some of these vehicles are six-wheelers of relatively high capacity, with trailers for luggage and mails.

Klintehamn-Roma Railway buses at Tofta, Isle of Gothland, Sweden

Among services in the far north may be mentioned those running from Gällivare and Murjek (close to the Arctic Circle) on the iron-ore line from Boden to Riksgränsen and Narvik in Norway. That from Gällivare is run by Swedish Royal Mail cars to Tärendö and Pajala, the latter 94½ miles from Gällivare. From Tärendö a route runs south to Övertorneå on the Finnish frontier (66½ miles) and from Pajala another runs almost due north to Muodoslompolo (70 miles). All the roads except for a few miles near Övertorneå are north of the Arctic Circle. One daily service is provided. The State Railways' buses supplement these and maintain, among others, a direct service from Övertorneå to Pajala (72 miles).

There is, of course, no question of competition in the far north, but even in Southern Sweden, with its many independent railway companies, co-operation rather than competition has been aimed at. The railways themselves have avoided competition in the past. The Isle of Gothland possesses three railway companies, the Gothland Railway, the Slite-Roma Railway, and the Klintehamn-Roma Railway, and railway buses act as feeders to these in outlying districts. Our illustration shows two Volvo buses, one of recent and the other of an earlier vintage, used on the coast road between Klintehamn and Visby. This road serves the village of Tofta, much visited on account of its bathing beach and its Viking ship-barrows. Narrowness of some of the roads necessitates restrictions on body dimensions and many buses have only one double row of the usual bucket seats facing forward, and the other side of the body is taken up by a single longitudinal seat facing inwards. The Swedish-built Volvo bus enjoys an ever-increasing popularity on such services as these. The Klintehamn-Visby service is run by the Klintehamn-Roma Railway.

London Country Buses "On Time"

The London Passenger Transport Board recently decided to make a comprehensive test of the timekeeping of Country Buses, and during the week from Saturday, June 26 to Friday, July 2, a check was made of every Country Bus running in Dartford, Gravesend, Hertford, Luton, Redhill, St. Albans, Sevenoaks, Watford, Croydon, and Windsor. The total number of buses checked was nearly 19,000, and of these nearly 17,000 were exactly on time and only 26 were more than 10 minutes late. The detailed results of the census are as follow:—

	Number	Percentage
Buses on time	16,790	88·56
Buses 2 to 6 min. late	2,063	10·88
Buses 7 to 10 min. late	80	0·42
Buses more than 10 min. late ..	26	0·14
	18,959	100·00

A North-East Coast Acquisition.—At the beginning of this week United Automobile Services Limited took over the bus services of County Motor Services Limited, of Choppington, Northumberland. The business was established as Gordon & Sons, and on January 12, 1929, was incorporated as a private company called County Motor Services Limited, but control was retained in the hands of the Gordon family. Early in January, 1933, the company's long-distance routes were taken over jointly by the U.A.S. and the S.M.T. Then in February, 1934, the U.A.S. acquired three of the Newcastle area routes, leaving the County company with only Ashington workings.

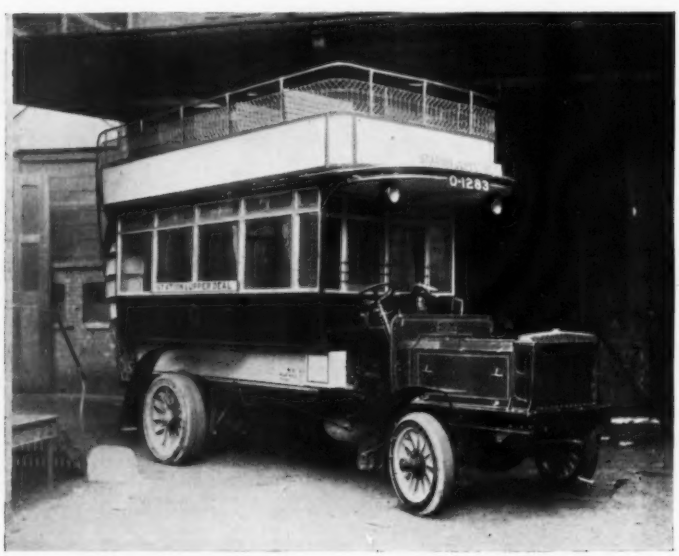
The Coming-of-Age of the East Kent

Within the space of 21 years this notable railway-associated bus company has increased its fleet tenfold, and now conveys some thirty million passengers per annum

AS the present month marks the completion of 21 years of corporate life of the East Kent Road Car Company, a suitable opportunity is presented to review briefly the development of this interesting and well organised railway-associated undertaking. At the time of its formation during the war period, a broad policy was adopted which has been followed without essential change ever since, and in this respect the East Kent Road Car Company is unusual; in fact, it has proved a model for certain more recently formed businesses. On its formation the business represented an amalgamation brought about by Mr. S. E. Garcke of various interests working in the eastern part of Kent, including companies associated with the late Mr. W. F. French and subsidiaries of the British Automobile Traction Co. Ltd. and of Thomas Tilling Limited. One of these dated back to 1908 and subsequent acquisitions of the company have brought within its fold even earlier businesses working on the Kent coast, including London & South Coast Motor Service Limited, which was formed as long ago as November 17, 1905.

Early type of open motorcoach in the service of the British Automobile Traction Co. Ltd. at Deal about 1910

At the time of its incorporation, however, on August 11, 1916, five constituents were merged to form the East Kent Road Car Company, and these were formally taken over on September 1 of that year. The earliest was the Deal & District Motor Services (not a limited company), which had quite an exceptional origin recalling a long-forgotten chapter in motorbus history. Early in 1908 the Birmingham & Midland Motor Omnibus Co. Ltd. came to the conclusion that urban motor services were not then profitable and decided to revert to horses. Some of its best motor vehicles, failing to find a purchaser at a satisfactory price, were put to work in other districts far removed from the Midlands, and thus the peculiar position arose that the Birmingham & Midland Motor Omnibus Co. Ltd. actually worked local services on the Kent coast under the trading name of Deal & District Motor Services at a time when it had no motorbuses in its own Midland district. In April, 1910, this Deal branch was transferred to an associated company of the group, namely the British Automobile Traction Co. Ltd.



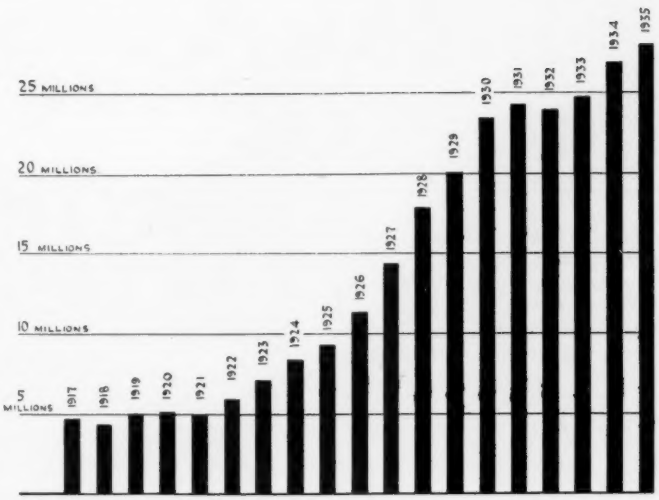
One of the original Brush buses of the Deal & District Motor Services, introduced on the Kent coast in 1908

Two companies associated with Mr. French were the Margate, Canterbury & District Motor Services Limited, and Ramsgate Motor Coaches (Griggs) Limited, and these were both working in the Thanet area and also provided links with Canterbury. Another of the original five which linked Canterbury with coastal resorts was the bus department of Wacher & Co. Ltd., a well-known Herne Bay firm. The remaining undertaking to be absorbed at that time was a branch of Thomas Tilling Limited, known as the Folkestone District Road Car Company, which was established in April, 1914.

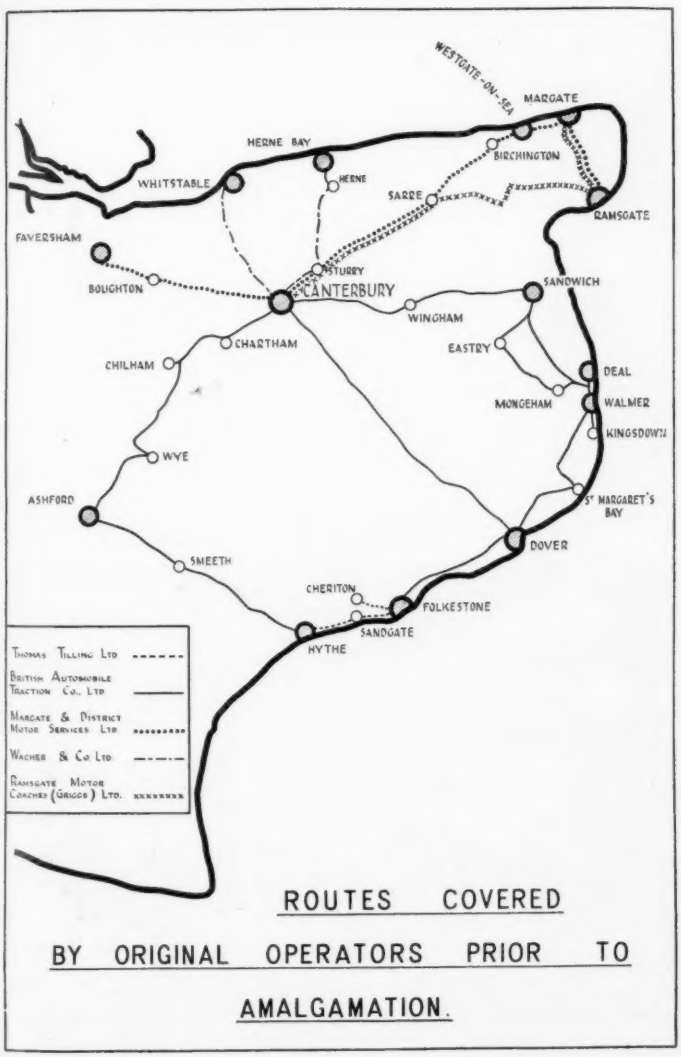
As East Kent contains the ports chiefly concerned with Continental traffic, the district was particularly affected by the war. Many camps were situated in this area apart from the permanent military establishment at Shorncliffe. The increased activity at the Channel ports, particularly in the naval base of Dover and the establishment at Sandwich of the large Inland Water Department depot with its Continental train ferry from Richborough, resulted in greatly enlarged transport requirements in the locality; and the war-time scarcity of drivers and shortage of supplies added to operating difficulties. An additional heavy task was thrown upon local bus proprietors

following the great landslip between Dover and Folkestone in December, 1915, and it will be recalled that rail connection between these ports remained severed throughout the war period. These difficulties were some of the powerful factors influencing the decision of the five concerns previously mentioned to pool their resources, and thus the present East Kent Company came into existence. At the close of the war the company possessed only 58 buses, and many of these were incapable of maintaining a regular service owing to unavoidable neglect. Between then and now the enormous expansion of activities may be gauged by the fact that the company works a fleet of 546 vehicles. Some part of this expansion is, of course, accounted for by the acquisition of competing businesses, and no fewer than 41 operators of buses and coaches have transferred their undertakings to the East Kent Road Car Company.

From its formation the company adopted as the limit of its operations that part of Kent and Sussex east of a line running through Faversham, Ashford, Rye, and Hastings, and working agreements were made with the neighbouring (and associated) companies, Maidstone & District Motor Services



Graph showing the numbers of passengers carried per annum during the years 1917 *to* 1935



Limited, and Southdown Motor Services Limited, which agreed their respective spheres of influence and permitted the various companies to develop steadily their own territories. These three companies were among the five with which the Southern Railway Company entered into a co-ordination agreement at the beginning of 1930. So far as the East Kent shares were concerned the Southern Railway paid 43s. 6d. for each 20s. share, and acquired approximately $\frac{1}{3}$ of the issued ordinary share capital. An exactly equal holding (namely 115,286 ordinary shares) is in the hands of Tilling and British Automobile Traction Limited. The Southern Railway is represented on the East Kent board of directors by Mr. R. G. Davidson and Mr. John C. Chambers, and in addition a co-ordination committee has been set up to secure the closest practicable working between the railway services and the passenger road services of the bus company.

The registered and head offices of the company are in Station Road West, Canterbury, where also are the headquarters of Mr. Alfred Baynton, Secretary and Joint General Manager, and Major C. J. Murfitt, O.B.E., Joint General Manager. Naturally, the bulk of the company's business consists of maintaining regular motor services between the many towns and villages in those parts of Kent and Sussex which are comprised in its territory; in fact, the regular services cover more than 1,752 route miles, and convey about 30,000,000 passengers per annum, which as will be seen from one of the accompanying graphs, is more than sixfold of the total 20 years ago.

A recent development has been the considerable increase in the maintenance of purely urban services. Ever since its formation, the company has played a prominent part in catering for the local traffic of the Folkestone, Hythe, and Sandgate district. It has also maintained a proportion of the local services in the neighbourhoods of Margate and Ramsgate under a scheme which (in the days before the Road Traffic Act, 1930) was enforced by the municipal licensing authorities in Thanet, whereby operators seeking licences

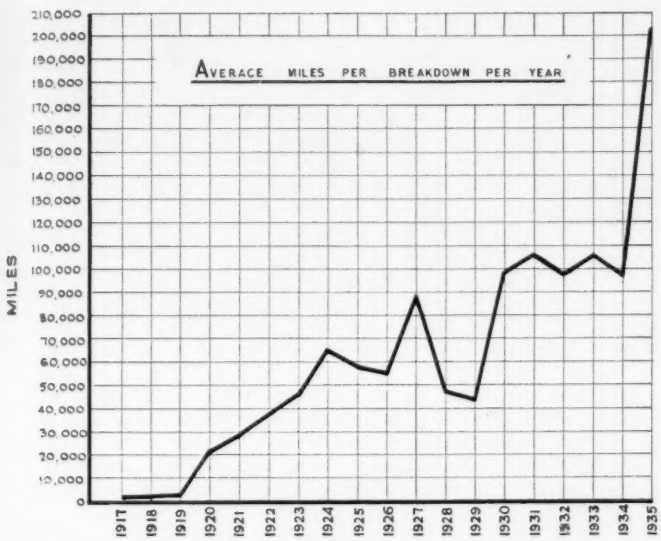
Right: A Leyland saloon on express service. Dover Castle makes a picturesque setting for this coach, which is one of 83 vehicles of the make used for limited-stop workings such as those between London and the Kent coast

Left: One of 90 modern Leyland double-deckers. This type of bus has been used to an increasing extent within recent years, partly as a result of the company having assumed responsibility for many more urban services

Right: A Dennis bus on local service between Deal and Dover. The East Kent fleet includes 80 single-deck vehicles on Dennis chassis

TYPICAL VEHICLES IN THE MODERN EAST KENT FLEET

for longer distance services and tours were required to take their part in contributing to the all-the-year-round local needs. The East Kent organisation next assumed the responsibility for local services in Canterbury, and subsequently similar developments have taken place in Herne Bay, Deal, and Ashford. The present year has seen a very considerable increase in this type of business, for, on January 1 last, an agreement with the Dover Corporation came into force whereby the local tramways in Dover were abandoned on the last day of 1936 and East Kent buses were put to work in replacement on the following day. Then, on March 25 last an agreement became effective whereby the company took over the transport (tram and bus) business of the Isle of Thanet Electric Supply Co. Ltd., and on that date replaced the Thanet trams with modern diesel-engined buses. Thus East Kent vehicles now play a prominent part in urban transport throughout the district, and it is of interest to note that no municipal transport or trams are working in any part of the company's territory.



Graph showing the very satisfactory breakdown average that has been achieved

Another sphere in which the East Kent Company was a pioneer is in the maintenance of long distance motor-coach services. These originated as long ago as the summer of 1920 when the Margate—London route was inaugurated. This was organised jointly with Motor Coaches Limited of London (another B.A.T. company) under an agreement whereby each operator worked from its own base and exchanged passengers at Maidstone. In the following year the East Kent Company also established weekend services from other Kent coast resorts, and this formed the nucleus of the extensive system of limited-stop services now working all the year round to and from the Victoria Coach Station. The East Kent was, in fact, one of the early partners in the coach pool established under the title of London and Coastal Motor Coach Services, and when this was succeeded on April 30, 1925, by London Coastal Coaches Limited, the East Kent became one of the original shareholders. In addition to its express workings to London, the East Kent inaugurated through workings between Margate and Hastings soon after the war. This service has proved such a success that of recent years its functions have been divided so that frequent workings between Margate and Hastings cater for semi-local traffic, while express cars are superimposed to deal with long-distance through passengers from Kentish points to Portsmouth, Bournemouth, and the West of England.

Important depots have been established at Cheriton and Seabrook (Folkestone), Herne Bay (with a sub-depot at Whitstable), Ashford, Westwood and St. Peters (Thanet), Deal, Dover, Faversham, Margate, Ramsgate, and Rye. Enquiry and booking offices have been established in all of these towns, and also at Broadstairs, Hastings, Hythe, and Sandwich. There are also dormy sheds at various points where buses terminate journeys at night away from the central depot.

The present East Kent fleet comprises the following :—

Double-deck buses	
Leyland	90
Morris	30
Daimler	9
Dennis	1
Single-deck buses	
Tilling Stevens	130
Dennis	66
Morris	25
Daimler	5
Saloons	
Leyland	83
Tilling Stevens	48
Morris	42
Dennis	14
A.E.C.	1
Open Tourers	
Tilling Stevens	2
Total	546

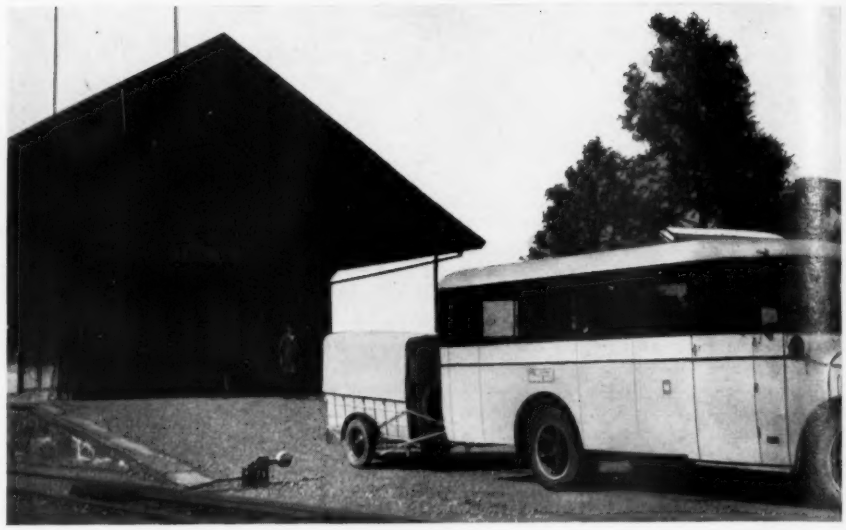
In Canterbury the company owns several premises, most of them in close proximity to the head offices. Mechanical works are in Kirby's Lane, and the body works (erected in 1927) in St. Stephen's Road, with main and relief garages adjacent. A body works at Margate deals with such features as painting and upholstery. The engineering works are well equipped to carry out complete chassis overhauls, and an electrical shop deals with batteries, magnetos, and so forth. The body shop in Canterbury adjacent to the main service garage has up-to-date working machinery and other plant. Here also is the tyre department.

As the East Kent fleet comprises fourteen makes and types of vehicle, considerable versatility and craftsmanship are required among the maintenance staff, and, indeed it is found that the development of these qualities leads to highly satisfactory work. Routine depot jobs, such as cleaning, lubricating, and minor replacements, are conducted upon a well-ordered system applicable to vehicles of all makes, but heavier overhauls (conducted on a mileage basis) receive the specialised attention which the staff has been specially trained to give. Every section of the works is in charge of an experienced man capable of undertaking any job, and responsible for training one employee to do likewise. The ideal aimed at is that no unit for repair shall be kept waiting until a particular mechanic is available; the men's work is therefore varied, and it is found that this variety actually leads to faster output than when tasks are entirely routine and repetitional. The amount of skilled attention available also results in economies by enabling the last possible passenger-mile to be secured from all chassis components. Parts worn beyond the recognised limits in their original positions are often used satisfactorily in chassis assemblies subject to lighter loads. In some cases worn parts are remachined to suit chassis of other types; such procedure, which would not be possible under a stereotyped maintenance system, helps the company in its policy of economising by running its fleet with a reasonably restricted supply of replacements.

Overseas Notes

Sleeping Cars and Restaurants on German Buses

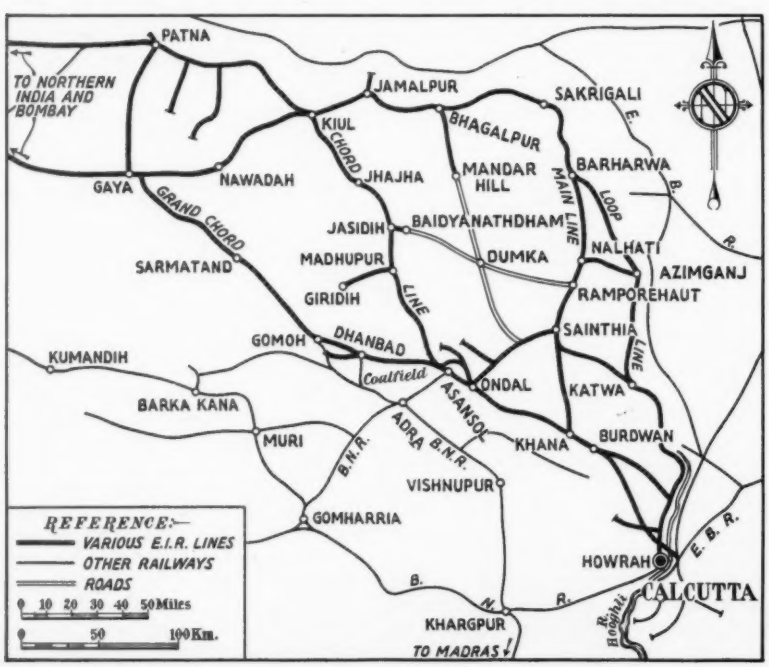
A motorbus with a restaurant on board has been put into service in Western Germany. The bus contains seating accommodation for 35 persons, and in a second compartment is a table at which eight persons may be seated and can obtain tea, coffee, chocolate, eggs, cold meat, wine, beer, and cocktails. The bus is also provided with a small library of books. The Baltic seaport of Stettin has followed this by producing a motorbus which can be changed in a few moments into a sleeping car, as seats specially built and upholstered in satin can be reversed to form comfortable beds. This bus also has a loud speaker fitted—for use in the daytime!



Swiss postal bus, with detachable parcels trailer, on regular service linking a station on the Federal Railways with outlying parts

New Co-ordinated Transport, East Indian Railway

On August 1, the East Indian Railway opened an out-agency at Dumka, an important civil and commercial station in the Santal Pergannas in Bihar, with co-ordinated arrangements for the transport by buses of passengers parcels and goods between Dumka and the E.I.R. railheads at Ramporehaut and Mandar Hill. Similar arrangements have also been made in respect of parcels and goods between Dumka and Baidyanathdham. Buses operate to a scheduled timetable which has been fixed after careful consideration of railway connections. Two buses work in each direction on each of the routes. For the present the new out-agency is open only for local booking, but through booking facilities will be provided from October next. Dumka is in the centre of the area bounded by the E.I.R. loop and main lines, and communications in this area are often inconvenient, as indifferent bus or taxi services and bullock carts have provided the only means of transport. The enterprise of the railway in effecting co-ordinated transport arrangements to serve this important area is to be commended.



The new motor routes in relation to the main E.I.R. lines

German Tramway Statistics

The "Statistisches Jahrbuch Deutscher Gemeinden" (Statistical Yearbook of German Municipalities) gives some interesting details concerning the German tramway industry, especially as for the first time all German tramways are included, and not, as formerly, only those in cities of more than 50,000 population. There are now tramways in 168 German cities and towns, and the length of the lines aggregates 6,135 km. of double track, or a total trackage of 10,900 km. During the year 1935-36, covered by the last report, the numbers of passengers carried totalled 2,899 millions; about 95,000 persons are employed by the industry.

Trolleybuses to replace Motorbuses in Italy

In order to comply with the orders of the Government to reduce imports of petrol and heavy fuel oil, trolleybuses are to be submitted for motorbuses between Milan and Lodi, a distance of about 20 miles. It is anticipated that, as well as saving considerable quantities of fuel, the journey time will be reduced by about 15 min., as the trolleybuses are to be capable of speeds up to 75 km. (46½ m.)p.h., and each will carry 60 passengers. Although this improved service might be expected to be in competition with the section of the Milan-Bologna railway between Milan and Lodi, actually the State Railway authorities have decided to concentrate upon longer-distance traffic, leaving the local services to private road concerns.

WIRELESS SIGNALLING FOR SHUNTING YARDS

The Aga-Baltic system as installed at Malmö, Swedish State Railways, for communicating with drivers by light signals or telephony

A NEW system of wireless signalling for use in shunting has recently been installed at the Malmö yard, Sweden, by the Aga-Baltic Company, of Stockholm. The equipment consists of a transmitter tuned to send a number of different frequencies, each corresponding to a different order to the driver of the shunting engine. The transmitter is operated from a separate control box by the shunter, the overhead high-tension lines in the yard serving as aerial. On the engine are a wireless receiver with loudspeaker, and a signal panel with selective relays and flashlamps. By pressing a button in the control box, the shunter informs the engine driver by a high-pitched note in the loudspeaker that an order is being given, the nature of it being seen from the signal panel, part of which is then lighted up. The signal indication will remain until changed by the shunter, the alteration being again notified by a signal from the loudspeaker. If a special order, not included on the signal panel, has to be given, the shunter can switch on a microphone and send a verbal message to the driver.

The equipment works equally well with both steam and electric trains; there is little interference from the latter, despite the sometimes severe arcing at the bow collectors. The apparatus was developed by the Aga-Baltic Co. Ltd. in collaboration with the engineering department of the Swedish State Railways.

Left: Shunter telephoning to driver of shunting engine from one of the control boxes. Right: Hut containing transmitter equipment

Success of Faster C.P.R. Freight Trains

A satisfactory return of freight traffic to the railway between Montreal and Toronto is noted in a recent issue of the *Canadian Pacific Staff Bulletin*, and is shown to have been consequent upon the speeding up of train services. The faster trains were introduced in 1935, and in two years the volume of goods despatched by rail between the two cities has approximately doubled. Co-ordinated rail and lorry services have been introduced between Montreal and St. Jerome, and traffic passing here in May this year showed an increase of 137 per cent. compared with May, 1934, before the facilities were improved. Not only has the running of trains been accelerated, but the provision of extra night and early morning staff at stations has made freight available for earlier delivery. A recent check showed that merchandise for all points had been cleared from the Montreal freight shed by 9.30 a.m. The work has been similarly expedited at transfer points. Consignments arriving in the evening formerly remained overnight before being sent forward, but are now put on the first connecting train after arrival. At one station the average time that goods are detained has been found to work out at only $1\frac{1}{4}$ hr.

Right: The attractive G.E.C. lighting scheme carried out recently in the Norfolk Room at the Great Eastern Hotel, Liverpool Street station *(see paragraph on page 375)*

Below: Re-railer at the approach to the Meudon viaduct of the French State Railways, between Paris (Montparnasse) and Versailles. This viaduct was recently widened to take four tracks in connection with the Paris-Le Mans electrification described in our Electric Railway Traction Supplement of May 28, 1937

Left: Early French rolling-stock brought out of the museum in preparation for the centenary of the Paris to St. Germain Railway. This line, which was the earliest to be built in the neighbourhood of the French Metropolis, was authorised on July 9, 1835, and opened on August 26, 1837

RAILWAY NEWS SECTION

PERSONAL

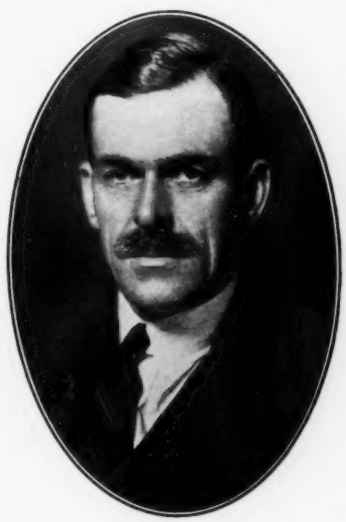
Mr. Samuel Thomas Bledsoe, President and Chairman of the Executive Committee of the Atchison, Topeka, & Santa Fé Railway System, has arrived in London from Chicago, and is staying at Grosvenor House, Park Lane.

Mr. C. E. Fairburn, M.A., who, as recorded last week, has been appointed Deputy Chief Mechanical Engineer and Electrical Engineer, L.M.S.R., had a brilliant career at Oxford, where he took no fewer than three First Classes, in Mathematical Moderations, Mathematical Final Schools, and Engineering. In 1908 he was awarded a Hulme Exhibition at Brasenose College for four years, which is for graduates only. Mr. Fairburn was a pupil under Sir Henry Fowler at Derby from 1910-12, and at the same period studied metallurgy at Sheffield University. In 1912 he joined the Railway Department at Siemens Bros., dynamo works, and a year later took charge of the outdoor erection work for the Newport-Shildon electric line of the North Eastern Railway, and between then and 1916 was responsible for placing the overhead line and the locomotives in service. Joining the Royal Flying Corps as Experimental Officer in 1916, he eventually commanded an experimental squadron as Major. In 1919 Mr. Fairburn joined the English Electric Co. Ltd. to organise and build up a railway electrification department. He became General Manager of the Preston Electrical Works in 1926, of the Car Works in the following year, and of the Stafford Works in 1928, though retaining charge of the two works at Preston in addition. He was also in control of the Traction Department at the same time. In 1931 he returned to London as Engineer and Manager of the Traction Department, with responsibility for all classes of railway material, and in 1933 was in addition appointed Chairman of the Contractors' Committee for the electrification of the Polish State Railways, the contract for which was jointly held by the English Electric and the Metrovic companies. Mr. Fairburn was appointed Electrical Engineer of the L.M.S.R. in 1934.

Photo] [*Railway Gazette*

Mr. C. E. Fairburn, M.A.

Appointed Deputy Chief Mechanical Engineer and Electrical Engineer, L.M.S.R.



Mr. R. A. Riddles

Appointed Mechanical and Electrical Engineer, Scotland, L.M.S.R.

Elliott] [*& Fry*

Mr. H. G. Ivatt

Appointed Principal Assistant to C.M.E. (Locomotives), Euston, L.M.S.R.

Mr. R. A. Riddles, who, as announced in THE RAILWAY GAZETTE of August 20 has been appointed Mechanical and Electrical Engineer, Scotland, L.M.S.R., began his railway career as a premium apprentice at Crewe works, London & North Western Railway, in 1909. He saw war service with the Royal Engineers from 1914-19, and in December, 1920, was appointed Assistant to the Works Manager at Crewe, where he subsequently became Progress Assistant in 1925. Three years later Mr. Riddles was promoted to be Assistant Works Superintendent at Derby, and in 1931 was transferred to Crewe in a similar position. In August, 1933, he was appointed Locomotive Assistant to the Chief Mechanical Engineer at Euston, and in August, 1935, became Principal Assistant to the C.M.E. Mr. Riddles is a Member of the Institution of Mechanical Engineers, and also a Member of the Institution of Locomotive Engineers.

Mr, H. G. Ivatt, who, as officially announced in these columns last week, has been appointed Principal Assistant to the Chief Mechanical Engineer (Locomotives), Euston, L.M.S.R., was educated at Uppingham School and obtained his railway training with the former London & North Western Railway at the Crewe works. After a period in the drawing office, he became Assistant Running Shed Foreman at Crewe; subsequently took charge of experimental locomotive work; and later was appointed Assistant in the Outdoor Machinery Department. During the war he served on the Staff of the Director of Transport in France, and attained the rank of Major. On returning to this country he became Assistant Locomotive Superintendent of the former North Staffordshire Railway at Stoke. Consequent upon the amalgamation and the closing of the works at Stoke, he was transferred to Derby and appointed Works Superintendent of the Derby Locomotive Works in May, 1928. From the beginning of August, 1931, the Outdoor Machinery and Fire Sections of the Midland Division also came under his control. In November, 1932, he was appointed Divisional Mechanical Engineer, Glasgow, which post he has held until his present appointment. Mr. Ivatt is an Associate Member of the Institution of Mechanical Engineers.

Mr. I. S. W. Groom, whose retirement on July 31 from the position of

Mr. I. S. W. Groom

Locomotive Running Superintendent, Southern Area, L.N.E.R., 1931-7

Mr. G. E. Samuels

Acting General Manager, Ceylon Government Railway

The late Mr. A. D. Jones

Locomotive Running Superintendent, Southern Railway, 1923-36

Locomotive Running Superintendent, Southern Area, L.N.E.R., was recorded in our issue of August 6, was educated at Oundle School, and served an apprenticeship under Mr. H. A. Ivatt, Mechanical Engineer, Great Northern Railway. He gained experience in the Locomotive Running Department as Inspector Foreman, and Assistant to the District Superintendents at Peterborough, Doncaster, and Nottingham, afterwards becoming District Superintendent at Grantham, and West Riding of Yorkshire. In 1913 he was promoted to be Assistant to Mr. F. J. Webster, Locomotive Running Superintendent of the Great Northern Railway, under Mr. H. N. Gresley, Mechanical Engineer, who followed Mr. Ivatt. On the retirement of Mr. Webster in 1918, Mr. Groom was made Locomotive Running Superintendent, and upon the amalgamation of the railways became Assistant Locomotive Running Superintendent, Southern Area, L.N.E.R. In 1926 Mr. Groom was appointed Locomotive Running Superintendent for the Scottish Area, and succeeded Mr. W. G. P. Maclure as Locomotive Running Superintendent, Southern Area, in 1931.

Mr. G. E. Samuels, B.A., B.A.I., M.Inst.C.E., Chief Engineer of the Ceylon Government Railway, and at present Acting General Manager, was educated at Corrig School in Ireland, and at Trinity College, Dublin, where he graduated through the Classical Honours course. After taking the Engineering degree in 1908, he became a pupil to Messrs. Sir B. Baker and Hurtzig on the construction of the Armagh, Keady and Castleblayney Railway. He proceeded to South America in 1910 as Assistant Engineer for the Antofagasta (Chili) and Bolivia Railway, and was chiefly engaged as Engineer-in-Charge of the location, and later as Sectional Engineer on the construction of the Cochabamba branch, which runs through very difficult country from Oruro, in Bolivia, across the Andes and down their eastern slopes. Returning from South America shortly before war broke out in 1914, he joined the Royal Artillery and served on the Western front, reaching the rank of Major in 1917. After demobilisation in July, 1919, the troubled times in Ireland necessitated him staying there until the end of 1921. In 1922 he joined the Railway Extensions Department of Ceylon as Assistant Engineer, and was engaged on the construction of the branch lines to Trincomalee and Batticaloa. Transferring to the Ceylon Government Railway in 1926, he became Deputy Chief Engineer in 1933, and Chief Engineer in 1934. He has been acting as General Manager since January last in the absence on leave of Mr. W. G. Hills, who was acting in the same capacity. The Ceylon Government Railway, which has had to contend with great difficulties in the last few years due to depression in the tea and rubber industries and to unchecked road competition, was reported on last year by a commission under the chairmanship of Brig.-General F. D. Hammond, C.B.E., D.S.O., the recommendations of which were outlined in our issue of June 11 last.

Señor Arturo Noni, Inspector-General of Railway Accounts and Statistics, has been appointed Sub-Manager of the Argentine State Railways, vice Señor Adolfo P. Farengo, who has retired on pension. Señor Carlos Echegaray has been appointed Inspector-General of Accounts and Statistics, vice Señor Noni.

It is with regret that we record the death on August 22 of Mr. Arthur Dansey Jones, who, as recorded in our issue of March 6, 1936, retired at the end of February last year from the position of Locomotive Running Superintendent, Southern Railway. Mr. Jones, who was born in 1871, joined the former Lancashire & Yorkshire Railway as a pupil of the late Sir John (then Mr.) Aspinall at Horwich in 1889. In 1901, after experience at locomotive running sheds and in the Outdoor Carriage & Wagon Department, he was appointed Chief Assistant in charge of the Running Department of that company. Appointed in 1912 to the new post of Outdoor Locomotive, Carriage and Wagon Superintendent, S.E. & C.R., Mr. Jones remained in that position until he was made Locomotive Running Superintendent of the Southern Railway in 1923. He was created an Officer of the Order of the British Empire in 1936, and a Member of the Royal Victorian Order in 1929. In 1917-18 Mr. Jones was President of the Institution of Locomotive Engineers.

Mr. E. G. Salter, who, as we record in a note on page 357 of our Road Transport Section this week, has been appointed Superintendent of Road Transport, Travancore State, Southern India, held engineering appointments with Vauxhall Motors Limited, the Skefko Ball-bearing Co. Ltd., and other firms, before becoming Managing Director of Ideal Motorcoaches Limited in 1924. This company operated in the Luton and Dunstable area, and Mr. Salter was Managing Director until 1929, when, upon its absorption by the Eastern National Omnibus Co. Ltd., he was appointed Assistant District Superintendent, Luton. Fifteen months later he was promoted to District

Superintendent at Ware and Bishop's Stortford by the National Omnibus & Transport Co. Ltd. When the London Transport Act came into force in 1933, Mr. Salter was transferred to the head office of the Country Bus and Coach Department at Reigate, to take charge of the Schedules Office. Eventually he became Assistant to the Operating Superintendent, Operating and Traffic Department. Mr. Salter served with the Royal Navy during the war as an Ordnance Artificer. He sails for India from Marseilles on the ms. *Cheshire* on September 4.

From *The London Gazette* of August 20: Regular Army Supplementary Reserve of Officers, Royal Engineers, Transportation: Lt. H. L. Hopkins to be Captain.

The late Mr. R. C. Irwin, Secretary of the L.M.S.R. from 1923 to 1927, whose death on March 28 was recorded in our issue of April 2, left estate valued at £57,953 (£54,529 net).

Brig.-Gen. Geoffrey H. Harrisson, C.M.G., D.S.O., M.Inst.C.E., Chairman, Central Uruguay Railway, Midland Uruguay Railway, and other companies, arrived in Montevideo on July 10, on a business visit.

Mr. A. FitzHerbert Wright, for 46 years a Director of the Butterley Co. Ltd., has been obliged by ill-health to resign from the board of the company. He was Chairman for 23 years of his period on the board.

Herr Hans Gert Winter, Reichsbahndirektor, arrived in Buenos Aires on July 25 on a short visit, for the purpose of studying Argentine railway conditions and methods of working, as well as the possibilities of developing tourist movement between Argentina and Germany. Herr Winter left Buenos Aires on July 30 *en route* for Chile, travelling over the B.A. Great Southern and State Railways to San Carlos de Bariloche, and thence via the Southern Andine Lakes.

We regret to record the death on August 22 of Mr. C. O. D. Anderson, Chief Assistant to the Works Superintendent (Carriages and Wagons), Derby, L.M.S.R. Mr. Anderson, who was in charge of the Royal Scot train on its visit to the U.S.A. and Canada in 1933, joined the Furness Railway as Materials Inspector in 1920. He was appointed Assistant Works Manager of the Locomotive, Carriage and Wagon Department of that company in 1922, and a year later was made Carriage and Wagon Works Manager, Barrow, L.M.S.R. Mr. Anderson moved to Newton Heath as Works Superintendent in 1931, and was appointed to Derby shortly after his return from America.

STAFF AND LABOUR MATTERS

Railway Staff National Tribunal Decision No. 3

On Thursday, August 19, a special delegate conference of the National Union of Railwaymen decided to accept Decision No. 3 of the Railway Staff National Tribunal. The decision was summarised on pages 297 and 298 of our issue of August 13. The delegate conference of the union expressed regret at the small increases made by the tribunal to the lower-paid conciliation grades and instructed the executive committee to pursue, at the earliest opportunity, the claim for a minimum wage of 50s. a week for all adults. Mr. Marchbank was reported as stating that the delegate conference "was emphatic that the 50s. minimum wage should be conceded and made it clear that this was one of the first claims that would have to be pursued to a successful issue."

At the time of writing these notes no decision on the question of acceptance of the tribunal's decision had been announced by the Associated Society of Locomotive Engineers & Firemen or by the Railway Clerks' Association. The attitude of the companies towards the decision has also not yet been disclosed. It is, therefore, unlikely that the concessions which the tribunal recommended should be made to the employees will be given effect to, at least until all three railway trade unions have agreed to accept the decision.

As we are closing for press we learn that the Associated Society of Locomotive Engineers and Firemen, after a special delegate meeting which occupied two days, has decided to accept the decision of the Railway Staff National Tribunal.

It is expected that the Railway Clerks' Association will reach a conclusion on the matter on Sunday next.

Railway Shopmen

The agreement (recorded on page 329 of last week's issue) which was reached on August 16 by the National Railway Shopmen's Council, was considered by the National Union of Railwaymen's Delegate Conference on August 20. "While welcoming the week's holiday with pay and the cessation of the percentage deduction," said Mr. John Marchbank, the General Secretary, "the conference expressed regret that a larger increase, and affecting a larger number of the low-paid grades, had not been obtained and that a full guaranteed week's wage had not been assured for all sections of the shops staff. Notwithstanding disappointment on these points the conference approved the agreement, and at the same time it instructed the executive committee to take early opportunity of pressing for the raising of the minimum wage to 50s. a week, as had already been decided on Thursday in respect of the conciliation grades."

The railway lines committee of the Amalgamated Engineering Union also decided to ratify the agreement. A resolution was passed expressing "entire dissatisfaction at the meagre offer made by the railway companies to our application for increased wages and improved working conditions." The resolution continued: "We are dissatisfied that no progress has been made with our request for increased wages, consolidation of wages, the guaranteed week, and the shorter working week, which are vital necessities to engineers, many of whom employed by the railway companies have not for many years had a full week's work, nor a full week's wages."

Dockers' Wages

The rates of pay of dock labourers are to be increased by a shilling a day, with effect as from September 20. An official statement on the matter records that the negotiations between the port employers and the trade unions connected with the National Council of Port Labour, which had been going on for some time have now reached a definite stage. Both sides decided to recommend to their constituents acceptance of a settlement, the principal points of which are as follow: "1.—Dockers' rates of pay to be increased by 1s. a day, on the present half-daily basis; this increase to apply both to time workers and piece-workers in conformity with the national agreements, and to come into force on September 20. 2.—Both sides immediately to get together to devise methods to give greater security of tenure to the dock worker, a framework of suggestions to be sent to the individual ports this week for their detailed consideration. As part and parcel of this scheme, there will be considered methods to give financial assistance to the older men who may be dispossessed of registration tokens by any schemes which may be adopted, and a method of making provision for holidays with pay."

Forthcoming Events

Sept. 4–12.—Institution of Railway Signal Engineers. Summer Meeting Cruise.
Sept. 6–9.—Institute of Metals, at Department of Applied Science, Sheffield University. Autumn Meeting.
Sept. 14 (*Tues.*).—Permanent Way Institution (Guildford). "A Realistic View of the Railway Future," by Mr. W. A. Willox.
Sept. 16–25.—*The Model Engineer* Exhibition, at Royal Horticultural Hall, Vincent Square, London, S.W.1.
Sept. 25 (*Sat.*)—Permanent Way Institution (Manchester-Liverpool), at Blackpool, 3 p.m. "Railway Drainage," by Mr. F. McCandlish.
Sept. 30 (*Thurs.*).—Permanent Way Institution (Brighton), at Welfare Room, Eastbourne, 7 p.m. "Leads of Crossings on Basis of Unit Angles," by Mr. R. Gurd.
May 18–21, 1938—Institute of Transport. Annual Congress at Edinburgh.
June 20–22, 1938.—Industrial Transport Association. Annual Congress at Hull.

XUM

NOTES AND NEWS

London Tube Name Changes.—The London Passenger Transport Board has announced that the Morden-Edgware Line will be known in future as the Northern Line, and the former Central London Railway as the Central Line. These changes are being made in preparation for the projections into outer suburban areas that are now being built.

Austrian Private Railway.—As from July 1, the management of the Eisenbahn Wien–Aspang/Schneebergbahn, has been vested in the Austrian Federal Railways. The Aspang Railway is owned by a Belgian company and runs south-west from its own terminus in Vienna to Aspang, 54 miles. There is a branch from Solltenau to the Schneeberg rack railway.

Italian Railway Accident.—A Reuters message from Genoa, dated August 23, reports a collision between two trains at Vigo Mavasso between Genoa and Caselle near Turin, in which five persons were killed and 20 injured. The latter were sailors, of whom 200 were travelling in one of the trains; two of them were in a very serious condition, and one was not expected to recover.

French Railway Nationalisation Proposal.—The French Cabinet deferred on August 24 details of the measure for taking over the French railways by a public corporation in which the State is to be the principal shareholder. These details have been under official consideration, and it is expected that they will be made public before the end of the present month, since the special powers under which the necessary order can be issued will expire on that date.

Angola-Cape Connecting Service.—A connecting service, with sleeping and dining accommodation, has just been introduced between Lobito Bay and Cape Town. A train leaves the Angola port at 6 p.m. every Tuesday and arrives at Elisabethville at 8 a.m. the following Saturday. After a wait of two hours another similar train leaves Elisabethville for the south, reaching Buluwayo at 8.15 a.m. on Monday and Cape Town at 2.43 p.m. on Wednesday. There is no corresponding service in the opposite direction, and to travel throughout in trains with sleeping and dining cars the northbound passenger must wait two days at Elisabethville.

Modernisation of Zetland Hotel, Saltburn.—The L.N.E.R. has decided upon a thorough modernisation of the Zetland Hotel at Saltburn. The principal features of the scheme are the provision of hot and cold running water in all bedrooms; the number of bathrooms is to be increased from five to fourteen; and four of the new bathrooms will be so arranged that they can be incorporated into private suites, if required. On the ground floor the existing dining rooms are to be converted into a lounge and reading room which will serve also as a ballroom. A new dining room will be formed by incorporating existing rooms on the side of the hotel fronting Milton Street.

Self-Changing Gear Trading Co. Ltd.—From August 23 this company requests that all correspondence should be addressed to Wadsworth Road, Perivale, Middlesex (Telephone, Perivale 1088), and not to 22, Old Queen Street, Westminster, S.W.1.

Museum on German Station.—A miniature museum has been established in a waiting room at the railway station of Alzey in Rhine-Hessen, Germany. The town hopes in this way to draw the attention of travellers to the existence in Alzey of a museum of local curiosities, including rich treasures from the early historic and Roman epochs.

More Soviet Railwaymen Executed.—A report from Moscow states that 34 employees of the U.S.S.R. Railways working in Eastern Siberia were executed at Irkutsk on August 19 for "wrecking and terrorism." It is added that they were also found guilty of being members of the Japanese Secret Service.

The Industrial Transport Association.—The association has accepted the invitation of its Hull branch to hold the 1938 congress in the city of Hull. Monday, Tuesday, and Wednesday, June 20, 21 and 22, have been approved as the dates for the congress, and the branch, under its Chairman—Mr. L. S. Pagan—will shortly begin to make the necessary plans.

Tientsin-Pukow Railway Loans.—The Hongkong & Shanghai Banking Corporation states that arrangements have been made whereby holders of bonds of the German issues of the Tientsin–Pukow Railway Loans of 1908 and 1910 may lodge coupons at 9, Gracechurch Street, E.C.3, for transmission to Berlin. Provisional receipts will be distributed to the presenting parties as soon as they have been received from the Deutsch-Asiatische Bank.

Institute of Transport Examinations, 1938.—The next examinations for graduateship and associate membership of the Institute of Transport will be held on April 28, 29 and 30, 1938, in London and at a number of provincial and overseas centres. Full particulars of the examinations, previous question papers (price 1s. a set, post free), and copies of a revised and enlarged edition of a booklet entitled "The Institute of Transport Examinations: notes for the guidance of candidates unable to attend preparatory courses" (price 2s. 6d., post free) may be had on application to the Secretary, the Institute of Transport, 15, Savoy Street, W.C.2. The closing date for the receipt of applications to sit for the examinations is March 1, 1938. Prospective candidates are advised to confirm, as soon as possible, their eligibility to sit for the examinations they have in view, and this they may do by communicating with the Secretary of the institute.

Electrical Engineering.—The winter session of the Borough Polytechnic begins on September 27, and a brochure just issued on the electrical engineering side contains information on evening courses in electric traction and electric railway signalling. Particulars may be obtained from the Secretary, Borough Road, London, S.E.1.

L.M.S.R. Facilities for Football Season.—During the forthcoming football season the L.M.S.R. is arranging for extensive cheap travel facilities to be available for "soccer" enthusiasts. For Saturday and important mid-week matches, cheap tickets at about single fare for the double journey will be issued from any L.M.S.R. station within an 80 miles radius of over 100 centres in England and Wales. For a large number of League and F.A. Cup matches, long-distance day and half-day excursions will also be run.

Proposed Tube Railway Under the Tyne.—Following the statement in our issue of August 13 (p. 301) that Arthur Whitley Limited has withdrawn its offer to build the proposed high-speed tube railway under the Tyne between North and South Shields, Mr. E. W. Chalmers Kearney, the inventor of the Kearney tube system, has issued a statement that the scheme is not dead. He added that, despite the decision of the South Shields and Tynemouth Corporations not to support the scheme, it was proposed to promote a Bill in Parliament under the sponsorship of "an important financial group."

Modernisation at Darlington.—The L.N.E.R. has decided to reconstruct the locomotive sheds at Bank Top, Darlington, and enlarge the adjacent Haughton Bridge up goods yard. A large part of the existing locomotive shed was built in 1841, the year the Great North of England Railway was opened from York to Darlington. The shed was originally designed and used as a wagon building and repairing shop. The importance of Darlington as a centre for stabling locomotives has increased considerably during the last few years and the demands continue to grow. Between 1928 and 1936 the mileage run by engines stabled at this depot had increased by 520,000 miles per annum. Apart from the modernisation of the structure, up-to-date equipment will be introduced to facilitate locomotive repairs; a mechanical coaling plant will be installed to replace cranes; new engine disposal pits with sunk ashpit roads will be provided; and the existing 60-ft. engine turntable will be superseded by a 70-ft. turntable on a new site. Improved accommodation for the clerical and supervisory staff will also form part of the reconstruction.

The present offices will be demolished and replaced by a two-storied building which will include a mess-room for enginemen. The Haughton Bridge up goods yard is bordered on the east by the present engine shed, and on the west by the main lines. The reorganisation of the engine shed and the alteration of the lines leading to and from the shed presents the opportunity of improving the layout of this goods yard, and additional reception lines and standage sidings are to be laid.

New Lighting at the Great Eastern Hotel, London.—An attractive lighting scheme has recently been completed in the Norfolk Room at the Great Eastern Hotel, Liverpool Street station, London. The L.N.E.R. engineers who carried out the installation work made use of G.E.C. circular lighting pendants specially designed to be in keeping with the architectural surroundings. These pendants are finished in ormolu and cast brass, with panels of pale and mid-amber flashed opal glass. Adequate diffusion of light is provided by the glazed cover and the bottom dish of white flashed opal glass. The main fitting houses fourteen 100-watt Osram lamps around the edge and one at the centre, while a number of smaller fittings of the same design are equipped with eight Osram lamps around the edge and one at the centre. On page 370 we reproduce a photograph of the re-lighted Norfolk Room.

G.W.R. - L.P.T.B. Extension.—First contracts for the construction of the westward extension from North Acton to Ruislip of the Central London tube have been placed by the Great Western Railway. Full details of this scheme, with a map, were given in the issue of our *Electric Railway Traction Supplement* dated November 13, 1936. A further extension to Denham is contemplated, and if and when this is completed, a tube service will run from Denham, through the City, and out to Ongar and Hainault in the east. Tentative schedules provide for a peak service of 12 trains an hour out to Greenford.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 33rd Week			Totals to Date		
	1937	1936	Inc. or Dec.	1937	1936	Inc. or Dec.
L.M.S.R. (6,871 mls.)	£	£	£	£	£	£
Passenger-train traffic...	613,000	587,000	+ 26,000	17,466,000	16,762,000	+ 704,000
Merchandise, &c. ...	493,000	482,000	+ 11,000	15,988,000	15,527,000	+ 461,000
Coal and coke ...	242,000	247,000	– 5,000	8,343,000	7,883,000	+ 460,000
Goods-train traffic ...	735,000	729,000	+ 6,000	24,331,000	23,410,000	+ 921,000
Total receipts	1,348,000	1,316,000	+ 32,000	41,797,000	40,172,000	+ 1,625,000
L.N.E.R. (6,315 mls.)						
Passenger-train traffic...	447,000	430,000	+ 17,000	11,413,000	10,858,000	+ 555,000
Merchandise, &c. ...	335,000	319,000	+ 16,000	11,018,000	10,601,000	+ 417,000
Coal and coke ...	252,000	234,000	+ 18,000	8,070,000	7,598,000	+ 472,000
Goods-train traffic ...	587,000	553,000	+ 34,000	19,088,000	18,199,000	+ 889,000
Total receipts	1,034,000	983,000	+ 51,000	30,501,000	29,057,000	+ 1,444,000
G.W.R. (3,738½ mls.)						
Passenger-train traffic...	293,000	289,000	+ 4,000	7,360,000	7,121,000	+ 239,000
Merchandise, &c. ...	204,000	191,000	+ 13,000	6,476,000	6,234,000	+ 242,000
Coal and coke ...	114,000	103,000	+ 11,000	3,639,000	3,268,000	+ 371,000
Goods-train traffic ...	318,000	294,000	+ 24,000	10,115,000	9,502,000	+ 613,000
Total receipts	611,000	583,000	+ 28,000	17,475,000	16,623,000	+ 852,000
S.R. (2,157 mls.)						
Passenger-train traffic...	419,000	412,000	+ 7,000	10,969,000	10,379,000	+ 590,000
Merchandise, &c. ...	66,000	64,500	+ 1,500	2,001,000	2,061,000	– 60,000
Coal and coke ...	30,000	32,500	– 2,500	977,000	1,005,000	– 28,000
Goods-train traffic ...	96,000	97,000	– 1,000	2,978,000	3,066,000	– 88,000
Total receipts	515,000	509,000	+ 6,000	13,947,000	13,445,000	+ 502,000
Liverpool Overhead ... (6½ mls.)	1,504	1,389	+ 115	43,108	39,542	+ 3,566
Mersey (4½ mls.) ...	3,731	3,695	+ 36	137,746	132,771	+ 4,975
*London Passenger Transport Board ...	535,500	545,500	– 10,000	4,448,000	4,420,800	+ 27,200
IRELAND						
†Belfast & C.D. pass. (80 mls.)	4,069	3,940	+ 129	89,426	89,619	– 193
,, ,, goods	391	519	– 128	16,022	18,356	– 2,334
,, ,, total	4,460	4,459	+ 1	105,448	107,975	– 2,527
Great Northern pass. (543 mls.)	16,250	15,850	+ 400	367,350	357,000	+ 10,350
,, ,, goods	9,350	9,400	– 50	308,700	322,600	– 13,900
,, ,, total	25,600	25,250	+ 350	676,050	679,600	– 3,550
Great Southern pass. (2,076 mls.)	57,680	55,516	+ 2,164	1,199,799	1,192,393	+ 7,406
,, ,, goods	39,087	41,495	– 2,408	1,340,203	1,364,154	– 23,951
,, ,, total	96,767	97,011	– 244	2,540,002	2,556,547	– 16,545

* 8th week (before pooling) † 34th week

British and Irish Railway Stocks and Shares

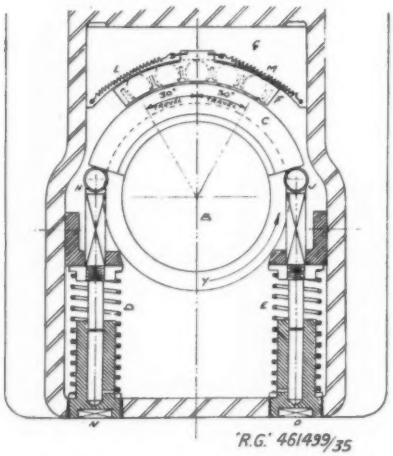
Stocks	Highest 1936	Lowest 1936	Prices Aug. 25, 1937	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	64¼	45½	63	–1
5% Con. Prefce. ...	126½	116¾	116½	—
5% Red.Pref.(1950)	113	108½	109½	—
4% Deb.	119½	110½	105½	–½
4½% Deb.... ...	121	114	111	—
4½% Deb.... ...	129	121	117½	—
5% Deb.	141	134	128½	—
2½% Deb.... ...	79⅛	74	69½	—
5% Rt. Charge ...	136½	130	127½	—
5% Cons. Guar. ...	135¼	127¾	124	—
L.M.S.R.				
Ord.	35⅝	17	32	–
4% Prefce. (1923)	83	52½	76	–½
4% Prefce. ...	92¾	81	82	–½
5% Red.Pref.(1955)	109¼	103¼	106	—
4% Deb.	111¾	105⅝	101½	–½
5% Red.Deb.(1952)	119⅝	115½	112½	—
4% Guar. ...	106¾	101⅝	99½	–½
L.N.E.R.				
5% Pref. Ord. ...	14	9	10	—
Def. Ord.	7¼	4¾	5	—
4% First Prefce.	79¼	55¼	72	–½
4% Second Prefce.	31⅞	18¼	29	—
5% Red.Pref.(1955)	100½	77¾	98	—
4% First Guar. ...	104½	98¾	97	–½
4% Second Guar.	99	90	90	—
3% Deb.	85¾	79	76	—
4% Deb.	109¾	104½	101	—
5% Red.Deb.(1947)	116¼	110½	110½	—
4½% Sinking Fund Red. Deb.	111½	107½	108	—
SOUTHERN				
Pref. Ord.... ...	98¾	82½	92½	—
Def. Ord.	27⅝	20⅛	23	—
5% Pref.	120¾	118½	113½	–1
5% Red.Pref.(1964)	119¾	115¼	113½	—
5% Guar. Prefce.	136	129½	125	—
5% Red.Guar.Pref. (1957)	120	115¾	114	—
4% Deb.	117⅝	109½	104	—
5% Deb.	140	134	126½	—
4% Red. Deb. 1962–67	116½	110	106½	—
BELFAST & C.D.				
Ord.	9	4½	4	—
FORTH BRIDGE				
4% Deb.	107	105	101½	—
4% Guar. ...	107⅝	104	100½	—
G. NORTHERN (IRELAND)				
Ord.	19½	9¾	7	—
G. SOUTHERN (IRELAND)				
Ord.	63	41	30	–
Prefce.	65	46	40½	–½
Guar.	97¼	81	71	—
Deb.	99¾	83¼	86½	—
L.P.T.B.				
4½% "A" ...	127¾	121	114½	—
5% "A"	138¼	133½	125½	—
4½% "T.F.A." ...	111½	108⅛	105	—
5% "B"... ...	131¾	123¾	117½	—
"C"	112½	93	82	—
MERSEY				
Ord.	40¾	23	30½	–1
4% Perp. Deb. ...	103	98	97	—
3% Perp. Deb. ...	78	74⅝	74½	—
3% Perp. Prefce.	68⅞	63¼	65⅛	—

ABSTRACTS OF RECENT PATENTS*

No. 461,499. A Self-Adjusting Axle Bearing

F. M. Lidstone, of "Dilham," 22, Laun Heads Avenue, Littleover, Derby, and C. J. Cruickshank, of "Liddesdale," Moorway Lane, Littleover, Derby. (*November* 6, 1935.)

If a vehicle is stationary for any length of time the film of oil between the upper bush of a bearing and the crown of a journal tends to become broken, resulting in a metal to metal contact. Consequently when the vehicle is first set in motion the initial frictional resistance is high until the film is formed once more. To reduce this initial friction the present invention provides a bearing bush *C* which is capable of making a limited circumferential movement against the action

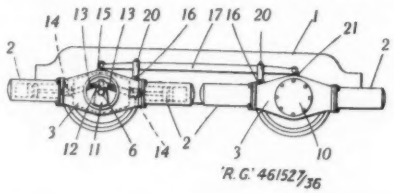


of springs *D*, *E*. To reduce this initial friction further, a spacing cage *F*, having bearing rollers, is provided between the upper bearing and a steel pad G. Light tension springs *L*, *M*, are also provided for keeping the bearing in position. With this arrangement it is stated that the initial rotation of the journal carries the bush *C* with it for a short distance until the bush gradually rides over the oil film on the side of the journal where the film was not broken, when the oil film becomes built up again.—(*Accepted February* 18, 1937.)

No. 461,527. Engine-Driven Trucks

Besler Systems, of 4,053, *Harlon Street, Emeryville, California, U.S.A.* (*April* 25, 1936.)

By this invention, the torque reactions and the unbalanced forces of an engine driving a rail truck, instead of being transmitted to the truck frame as is usually the case, are transmitted to the axle mountings, so that it is possible to construct the truck frame of much lighter material and to reduce the total amount of engine vibration transmitted to the truck frame. In a truck constructed according to the present invention, a reciprocating engine for driving the truck 1 is directly connected to the end of the axles in a manner such that it can pivot to a limited extent about the axle. A part of the torque reaction of one engine is

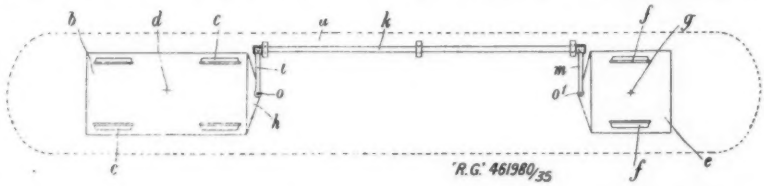


transmitted to the other axle by means of rods 17. Fig. 2 shows the use of two horizontally opposed engines, but the specification also shows the use of single-cylinder engines individual to each axle, and of a single-cylinder engine common to both axles.—(*Accepted February* 18, 1937.)

No. 461,980. A Rail Motorcoach

S. R. Devlin, of 9, *Buller Street, Derby* (*August* 26, 1935).

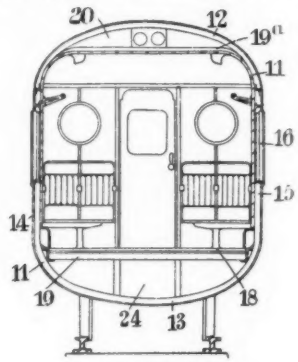
The two bogie trucks *b*, *e* by which the coach is solely supported, and of which one (*b*) is of the multi-axle type whilst the other (*e*) is of the single axle type, are interconnected by a shaft *k* and links *i*, *m* respectively, pivoted at points *o* and *o'* to the inner ends of the bogies which lie on the main axis of the vehicle. With this arrangement the wheels are stated to assume tangents to a curved track.—(*Accepted February* 26, 1937.)



No. 462,469. Railway Carriages

S. R. Devlin, 9, *Buller Street, Derby.* (*September* 13, 1935.)

Maximum space is provided below a railway coach for storing brake cylinders, lighting dynamos, accumulators and other accessories, whilst at the same time keeping them free from dust and readily accessible from the floor, by constructing the coach of metal cross-sectional frames which are of a closed ring-like oval form. The roof part 12 and the bottom part 13 are of curved shape connected by curved or straight parts 14 and 15 that form the sides. These parts are welded together, and a number of such frames, vertically spaced apart, constitute the skeleton of the coach. The frames are held by suitable longitudinal members which tie the vertical frames together, and thus form a longitudinal beam, leaving spaces for windows as at 16,



doors and other fittings. The framing is sheathed with metal plating on the outside in order to present a smooth unbroken surface and thereby reduce surface resistance to wind.—(*Accepted March* 10, 1937.)

No. 462,654. Train Signalling System

Y. N. Gore and V. Y. Gore, of "Sulo-Niketan" 7th Road, Khar, Bombay 21, *British India.* (*June* 11, 1935.)

In this invention, the track between two stations is divided into a number of sections; for example the track between the points at each end of the station forms one section, the track between the points and the home signal forms another, that between the home signal and the distant signal another, and so forth. At the end of each section short lengths of rails are provided, termed "feeler rails," placed in the centre and at the side of the track, with which shoes on the engine engage. The feeler rails of the various sections are electrically interconnected in a manner such that when a train is on a section circuits are closed which cause the brakes of any other train which enters the section to be automatically actuated. If desired the brakes of both trains may be actuated to prevent head-on collisions. The power for actuating the brakes is supplied by batteries carried on the engine, whilst a mechanism is also provided for cutting off the steam before the brakes are applied. The shoes, in contacting the feeler rails, also actuate

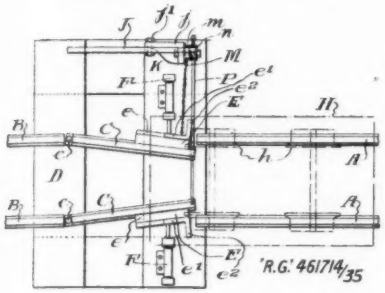
* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each

the necessary signals. — (*Accepted March* 11, 1937.)

No. 461,714. Railway Trucks for Collieries

J. Powis, of 57, *Hickman House, Parkfield Road, Wolverhampton, Stafford* (*November* 28, 1935).

This invention is primarily directed to the release of colliery tubs one by one down an incline, but is applicable

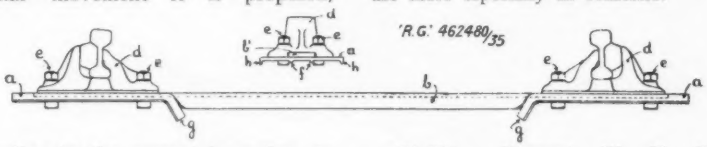


to railway trucks. According to this invention a section *C*, *C* of the rails is pivoted at *c*, *c*, to move inwardly as shown so that stops *E*, *E*, will abut against the front wheels *h* of the tub and stop it. To release the tub, foot lever *J* is pressed down to pull the pivoted rails into alignment with the other rail sections *A*, *B* against the action of a spring normally pressing the rails *c* inwardly. The wheels *h* maintain rails *c* in their aligned position until the tub has cleared the movable section.—(*Accepted February* 23, 1937.)

No. 462,480. Sleepers

W. J. Naisbitt, "Coniscliffe," Huntington Road, York. (*October* 21, 1935.)

To anchor a sleeper against longitudinal movement it is proposed,



according to the present invention, to provide a steel sleeper having two bearing plates *a*, *a* and a tie bar *b*, in which the bearing plates are bent to form a downwardly extending flange *g*. The bearing plates may also be provided with a downward bead *h* along each edge for retaining the packed material under the sleeper, whilst ribs *f* serve to lock the bolt heads against turning when the units *e* are tightened. —(*Accepted March* 10, 1937.)

COMPLETE SPECIFICATIONS ACCEPTED

461,499. Lidstone, F. M., and Cruickshank, C. J. Self-adjusting, spring-balanced, antifriction bearing applicable to railway carriage axles.

461,527. Dehn, F. B. (Besler Systems). Engine-driven trucks for rail vehicles.

461,585. Park Royal Coachworks Limited, and Needs, A. C. Construction of bodywork for vehicles.

461,642. Aktieselskapet Strommens Vaerksted. Spring and steering systems for road and rail vehicles.

461,714. Powis, J. Railway tracks for use more especially in collieries.

461,924. Tennant, W. H. (Tatra Works Limited, Motor Car and Railway Carriage and Wagon Builders). Vehicles for carrying liquids.

461,980. Devlin, S. R. Rail motor vehicles.

462,068. Bailey, D. Door fasteners on railway vehicles such as mineral wagons.

462,178. Monarch Door Controller Co. Limited, Smith, G. W. Pettigrew, and Sams, J. G. B. Shock-absorbing torque-transmitting means.

Rats on Railway Premises

(*From a Correspondent*)

The rat population of Great Britain is estimated at about 40 millions; how many of these inhabit railway property is unknown, but the proportion must be considerable. Of the two species of common rats in this country the brown rats are by far the more numerous and therefore responsible for more damage. The black rats are also plentiful, but their habits are somewhat different from the brown; they do not burrow very frequently but live under floors, rafters and similar places. These are usually the rats heard running about in roofs and ceilings; taken rat for rat they do just as much damage to merchandise and property as their brown relations, and are also well adapted to life on board ship inasmuch as they are better climbers than the brown rats. Both species are nocturnal or crepuscular in their habits, which accounts for their not being seen very often by day. The black rat is of smaller size than the brown, has larger ears, and a long, slender tail. The brown rat has smaller ears, with thicker and shorter tail.

Even when rats are well fed they will do a great amount of damage by gnawing to keep their incisors within reasonable length; otherwise these teeth would grow to a great length, and be a serious handicap. They will attack almost anything, wooden fencing, rafters, foundations, wire, gas and water pipes, insulations (which incidentally may cause fire through short circuiting), putty, and so on. Rat burrows have been the cause of the collapse of banks and walls, although a foundation of two or three feet deep should be safe as rats do not usually burrow much below a foot, and rarely two feet.

Although grain seems to be their chief food, rats will eat almost if not all that comes in their way, especially when food is becoming scarce, such as soiled linen, books, boots, dried ink, their dead comrades, and will even attack domestic pets and men. Railways afford excellent facilities for the distribution and feeding of rats; transport with food is provided, and breeding and feeding grounds may be in or near hotels, refreshment rooms, goods yards, warehouses, docks, canals, stables, the permanent way, and, in fact, any place where leakage or waste may occur.

The problem is, of course, how to keep rats down; total extermination is impossible, but with sufficient patience and continual campaigning rats may be removed from a given locality. Modern buildings should be insulated to prevent the entry of rats; foundations, doors, drains, and pipes must be amply protected, and all organic waste matter should not be put into bins or left in heaps, but incinerators should be provided wherever possible and all waste and litter (especially sweepings containing grain or bran) burnt.

Traps set in the runs are effective but if they are not continually in use the position after a few weeks is as bad as before. It is the male which is more usually caught, and as the rat is polygamous the birth rate is not altered very much, if at all. The brown rat usually travels in search of food, whereas the black rat lives on the premises, so to speak; thus it is obvious that a rat-infested building should be much easier to free from the pest than, say, clearing an area of rats. Poison gas can be used to advantage in some cases, but a good rat poison should be more effective if used judiciously. One drawback to killing rats in their holes is that the dead rats are there as a food reserve for other rats, and for the same reason the bodies should never be thrown away; the carcases may also serve as a breeding place for flies. Always burn dead rats, and, above all, exercise constant vigilance if rats are to be kept under.

Rats are good swimmers and can easily swim across rivers, dykes, canals, and moats, so that strips of water are of little use as a protection. Sometimes the water vole is mistaken for a rat, but the vole is a very different animal and has nothing in common with the rat, except that it too is a rodent; the rat, indeed, is its enemy. It is not only the damage to property and merchandise that rats do which renders them undesirable, for they also act as carriers of disease, and rat-tainted food consumed by human beings may give rise to serious and fatal infections. They may also carry the pores of fungi, one of which is the cause of dry rot.

Information in relation to rats and their extermination can be obtained from the Ministry of Agriculture and Fisheries, or from the Natural History Museum, South Kensington. Obviously, the rat is an enemy to which no quarter should be given.

CONTRACTS AND TENDERS

The L.M.S.R. has placed orders with G. R. Turner & Co. Ltd. for four 40-ton bogie trolley wagons, and with the Fairfield Shipbuilding & Engineering Co. Ltd. for three 50-ton and three 20-ton bogie trolley wagons.

Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Great Western of Brazil Railway for 50 25-ton all-steel covered goods wagons.

The Gloucester Railway Carriage & Wagon Co. Ltd. has received an order from the Sudan Government Railways for 23 third class and two first class bogie carriage underframes, complete with bogies, wheels, and axles.

La Brugeoise et Nicaise & Delcuve has received an order for 10 all-steel bogie covered goods wagons from the Peruvian Corporation.

Taylor Brothers & Co. Ltd. has received an order for 300 steel tyres and 75 steel axles for carriages and wagons from the Great Western of Brazil Railway.

The Madras & Southern Mahratta Railway Administration has placed the following orders to the inspection of Messrs. Rendel, Palmer & Tritton :—

T. F. Johnson, Miscellaneous tools.
Kitson & Co. Ltd., Two pairs of locomotive cylinders.
Dick's Asbestos Co. Ltd., 33 cwt. of steam packing.

James Archdale & Co. Ltd. has received an order for one 38-in. sensitive radial drilling machine from the Buenos Ayres Midland Railway.

The Bombay, Baroda & Central India Railway Administration has placed the following orders to the inspection of Messrs. Rendel, Palmer & Tritton :—

John Levick Limited, Lavatory fittings.
Rivet Bolt & Nut Company, Rivets, bolts, and nuts.
David Moseley & Son Limited, India-rubber hose.
Linley & Co. Ltd., Wood screws.

Stahlunion Export Limited has received an order from the Assam-Bengal Railway Administration, to the inspection of Messrs. Rendel, Palmer & Tritton, for 55,500 fishbolts and nuts.

Fleming & Ferguson Limited has received an order for one self-propelled dredger, for use on Lake Titicaca, from the Peruvian Corporation.

Guest, Keen & Nettlefolds Limited has received an order from the Bikaner State Railway Administration, to the inspection of Messrs. Rendel, Palmer & Tritton, for 383,000 keys.

The United Steel Cos. (India) Ltd has received orders from the East Indian Railway for the supply of a quantity of steel channels and angles.

Skoda (India) Limited has received an order from the Indian Stores Department for 30 sets of bogie wheels and axles for XC class locomotives, at a total price of Rs. 46,320.

The Indian Standard Wagon Company, through Burn & Co. Ltd., has received an order from the Indian Stores Department for 2,000 spring-top plates, at a total price of Rs. 13,500.

The Kumardhubi Engineering Works Limited has received an order from the Indian Stores Department for 200 coupled-wheel axleboxes at a total price of Rs. 48,600.

The Crown Agents for the Colonies have recently placed the following orders :—

C. Richards & Sons Ltd., Bolts and nuts.
Head, Wrightson & Co. Ltd., Bridgework, 120-ft. clear span.
Taylor Bros. & Co. Ltd., Carriage and wagon tyres.
Cochranes (Middlesbrough) Foundry Limited, Cast-iron pipes.
Staveley Coal & Iron Company, Cast-iron pipes.
Stanton Ironworks Co. Ltd., Cast-iron water pipes.
Glenfield & Kennedy Limited, Cast-iron swing arm oil and water columns.
Cellactite & British Uralite Limited, Cellactite corrugated sheets.
Lee Howl & Co. Ltd., Centrifugal pumps.
Sir Wm. Arrol & Co. Ltd., Circular high-water level and oil service tanks.
Nuts & Bolts (Darlaston) Limited, Clip bolts.
T. Bolton & Sons Ltd., Copper ingots.
Whitecross Co. Ltd., Copper wire.
English Electric Co. Ltd., Diesel engines.
Ruston & Hornsby Limited, Diesel engines.
R. A. Lister & Co. Ltd., Diesel-engined generating plants.
Norris, Henty & Gardners Limited, Diesel engines for launches.
Blackstone & Co. Ltd., Diesel engine for power house.
English Drilling Equipment Co. Ltd., Drilling rigs and tools.
General Electric Co. Ltd., Electric materials.
Siemens Bros. & Co. Ltd., Electrical materials, galvanised poles and hard-drawn copper.
Cranmer & Co. Ltd., Expanded metal.
Wm. Jacks & Co., Expanded metal sheets.
Stewarts and Lloyds Limited, Galvanised iron piping, galvanised steel water pipes, and wrought-iron pipes.
Alfred Herbert Limited, Lathe.
I.C.I. Metals Limited, Locomotive copper plates.
Horwell & Co. Ltd., Locomotive steel tubes.
Steel, Peech & Tozer (United Steel Cos. Ltd.), Locomotive tyres.
J. Neilson & Son Ltd., Marine boiler.
Hewittic Electric Co. Ltd., Mercury arc rectifier.
Whitehead Iron & Steel Co. Ltd., Mild steel.
Dorman, Long & Co. Ltd., Mild-steel angles.
P. & W. Maclellan Limited, Mild-steel plates and angles.

Bayliss Jones & Bayliss Limited has received an order for 20,000 steel fishbolts from the Cordoba Central Railway.

The Great Northern Railway (Ireland) has bought two double-deck buses, fitted with A.E.C. Regent chassis and engines. They will be delivered in an unfinished condition and the painting, upholstering, and completion of the construction will be carried out in the works of the company at Dundalk. The buses, which are similar to the double-deckers in the service of the London Passenger Transport Board, will be finished in the Great Northern standard colours—blue and white. When completed it is intended to try out the vehicles in a populous district already served by single-deck buses; if they prove satisfactory the use of the double deckers by the company will be extended.

Tenders are invited by the South Indian Railway Administration, receivable at 91, Petty France, Westminster, S.W.1, by September 3, for the supply of flanged plates.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), Simla, receivable by September 15, for the supply of rubber belting, required for coal conveyors, G.I.P. Railway.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Miscellaneous Branch), Simla, receivable by September 20, for the supply of grinding wheels required for the East Indian, Eastern Bengal, and North Western Railways at Calcutta and Storespura.

The Indian Stores Department is calling for tenders (No. M-921) for the supply and delivery as and when required during the period December 16, 1937, to December 15, 1938, of quantities of trade tools (including hand tools and small tools) such as beaters, ballast rakes, pick axes, shovels, hammers, drills, and hack saws. Tenders are receivable by the Indian Stores Department, Miscellaneous Branch, Simla, by September 13.

Exports of Railway Material from the United Kingdom in July

	July, 1937	July, 1936	Seven Months Ending July, 1937	Seven Months Ending July, 1936
	£	£	£	£
Locomotives, rail	93,952	141,877	650,979	952,352
Carriages and wagons	215,058	46,317	1,724,137	690,817
Rails, steel	189,077	221,104	816,281	784,339
Wheels, sleepers, fishplates and miscellaneous materials	177,343	129,169	888,345	873,008

Locomotive and rail exports included the following :—

	Locomotives July, 1937	Locomotives July, 1936	Rails July, 1937	Rails July, 1936
	£	£	£	£
Argentina	7,544	9,594	820	2,190
Union of South Africa	—*	—*	9,870	142,671
British India	28,033	8,744	7,154	11,503

* Figures not available

OFFICIAL NOTICES

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for :—
745 TYRES FOR ENGINES AND TENDERS.
Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after 29th August, 1937.
A fee of 10s. will be charged for each copy of the Specification, which is *NOT* returnable.
Tenders must be submitted not later than Noon on Tuesday, 31st August, 1937.
The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
T. R. WYNNE,
Managing Director.

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite Tenders for :—
(*a*) 776 STEEL TYRES FOR LOCOMOTIVES, CARRIAGES AND WAGONS (120 Broad Gauge and 656 Metre Gauge);
(*b*) 2,552 HELICAL AND 1,050 VOLUTE SPRINGS;
(*c*) BOLTS, NUTS, RIVETS, &c.
Specifications and Forms of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, S.W.1.
Fee ONE GUINEA each, *which will not be returned*.
Tenders must be submitted not later than 2 o'clock p.m. on Tuesday, 21st September, 1937.
The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the orders.

By Order of the Board,
G. W. V. DE RHE PHILIPE,
Secretary.

Gaekwar's Baroda State Railways

TENDERS in duplicate are invited for the supply, to the Gaekwar's Baroda State Railways, of steel sleepers for switch and crossing lay-outs and for corresponding clips, bolts and spring washers.
Schedules, specifications, drawings and tender forms may be obtained upon application to the undersigned.
No Tenders are to be submitted to the Gaekwar's Baroda State Railways in India, all must be submitted to the undersigned in London not later than 10 a.m. on Friday, 10th September, 1937.
All Tenders must hold good until Tuesday, 5th October, 1937.
Envelopes containing Tenders must be sealed and clearly marked outside "Gaekwar's Baroda State Railways—Tender for....."
Neither the Gaekwar's Baroda State Railways, nor the undersigned, bind themselves to accept the lowest or any Tender, or to assign any reason for the non-acceptance of a Tender.

RENDEL, PALMER & TRITTON,
Consulting Engineers.
55, Broadway,
Westminster,
London, S.W.1.
Friday, 27th August, 1937.

The Institute of Transport Examinations, 1938

NOTICE IS HEREBY GIVEN that the Graduateship and Associate Membership Examinations will be held in London and at other centres on Thursday, Friday and Saturday, April 28th, 29th and 30th, 1938.
The latest date for the deposit of forms of entry is March 1st, 1938 (January 1st if any exemptions are claimed). Full particulars, previous question papers (price 1s. per set, post free), and copies of a revised and enlarged edition of the booklet "The Institute of Transport Examinations: Notes for the guidance of candidates unable to attend preparatory courses" (price 2s. 6d. post free), may be obtained from the undersigned.

By Order of the Council,
A. WINTER GRAY,
Secretary.
15, Savoy Street,
London, W.C.2.
August 17th, 1937.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

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RAILWAY AND OTHER REPORTS

Netherlands Railways.—The receipts for the year 1936 dropped by 5·5 per cent. compared with 1935 to 95,576,502 florins, of which 52,168,000 florins came from passenger traffic and 38,500,000 florins from freight traffic. The operating expenses were 91,600,000 florins.

Netherlands East India State Railways.—For the year 1936 the revenue remained virtually the same as that for 1935 at 27,959,740 florins, but the working expenditure rose by 6·5 per cent. to 25,345,506 florins, giving an operating ratio of 90·8 compared with 85·8 in 1935.

Austrian Federal Railways.—The receipts for the year 1936 dropped by 4 per cent. compared with 1935, to a total of 409,846,773 sch., and the expenditure rose by 1½ per cent. to 455,122,279 sch. The number of passengers carried decreased by 5 per cent. to 51·3 million and the goods tonnage by 4·3 per cent. to 19·3 million.

Glasgow Underground Railway.—The annual report of the Glasgow Corporation Transport Department for the year ended May 31 last states that the underground railway earned £104,578 (compared with £85,693 in the previous year), and the working expenses were £104,008, leaving a net deficit of £21,747. Last year the deficit was £50,746. There were 51 cars and trailers in operation, and the number of passengers carried was 21,597,582, compared with 17,885,519 in the year 1935-36.

Benguela Railway.—The receipts for 1936 increased by 15 per cent. over the previous year's figure to £254,820 (at 110 angolares to the £), whereas the operating expenditure fell by 1¼ per cent. to £177,100, giving an operating ratio of 67·3. The net operating receipts advanced from £42,402 to £77,723. After deducting London and Lisbon office expenses, amounting to £24,616, the net revenue before making provision for renewals is £53,511, which has been set aside for payment of debenture interest. During 1936 a total of 376 debentures of a normal value of £16,960 were converted, leaving 932 with a nominal value of £46,720 outstanding at the end of the year. As regards renewals, it is the company's practice to charge against revenue each year the actual cost of replacements as a working expense. The capital account on December 31, 1936, stood at £12,522,721. Excluding service traffic, the tonnage of freight handled in 1936 was 264,796, an increase of 26 per cent., but the number of passengers remained the same at 154,500. Since the turn of the year the traffic has increased rapidly, and for the first five months the takings amounted to £117,734 and the net revenue to £47,449, respective increases of 39 and 100 per cent. compared with the corresponding period of 1936.

Hurst, Nelson & Co. Ltd.—The directors recommend a dividend of 1s. 6d. on each ordinary £1 share, or 7½ per cent., in respect of the year to July 17, last, payable November 11. For the previous year the ordinary distribution was 1s. 3d. a share, or 6¼ per cent.

William Asquith Limited.—The accounts for the 15 months ended July 1 last show a loss of £59,632, after charging directors' fees, against which there was a credit balance of £4,144 brought forward from the previous year, leaving a net adverse balance of £55,488. A considerable part of this deficiency relates to previous years, but has had to be dealt with in these accounts in order to clear up the position for the future. Following the appointment in March of this year of Mr. Lewis Rhodes as a Director and Chairman of the company a drastic change in the policy and management of the business was found to be essential. Messrs. Price, Waterhouse & Co., who were instructed by the board to examine the financial position of the company, advised that the proper financial position of the company could not be ascertained without a complete stocktaking and revaluation of the stocks and work in progress, and it was necessary to defer the presentation of a balance sheet which has now been prepared as at July 1, 1937, the date when the fresh stocktaking took place.

XUM

Railway Share Market

Although the stock and share markets have been steadier since commencement of the new Stock Exchange account on Monday, the volume of business remained extremely small and the general trend was again to lower prices. Home railway stocks were lower in most instances, but debentures and prior charges were inclined to improve in sympathy with the stronger tone of British Government securities.

L.N.E.R. second preference was bought on any reaction, the excellent increase in traffics for the past week being in excess of general expectations. The disposition was, however, to await the reception of the wages award by the rest of the railwaymen's unions. In the circumstances it is hardly surprising that lower prices were also made by junior stocks of the other main line railways. Great Western failed to respond to the good receipts announced for the past week and to the encouraging views which remain current as to the outlook for the Welsh coal trade. L.M.S.R. ordinary was also lower on balance, not having benefited from the traffics, while the 4 per cent. and 1923 preference stocks also attracted little attention, despite the apparently attractive yields offered. Southern deferred was out of favour owing to the view that, as a large part of the company's income is derived from the London Passenger area, it may obtain little benefit from the increase in transport charges, because the latter does not apply to the London Transport area. For this reason prospects of a larger dividend on the deferred stock are regarded in the market as uncertain. On the other hand, it has to be remembered that the half-yearly figures created a good impression, while only a moderate improvement in net revenue can influence earnings on the deferred stock a good deal, as the latter represents a small proportion of the company's total capital.

Foreign railway stocks were again reactionary, but this was still attributed more to the absence of buyers than to selling pressure. A better tendency is looked for in many quarters when markets become reasonably active. This applies particularly to the preference stocks of the Argentine railways, especially those of the Central Argentine and B.A. Western, it being assumed that the 4½ per cent. preference of the former and also that of the latter will receive their full annual dividends.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1936-37	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1936	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1936	Prices: Lowest 1936	Prices: Aug. 25, 1937	Yield £% (See Note)
South & Central America	Antofagasta (Chili) & Bolivia	834	22.8.37	£ 16,020	– £ 980	34	£ 549,210	£ 456,560	+ £ 92,650	Ord. Stk.	25	15¼	20	Nil
	Argentine North Eastern	753	21.8.37	11,725	+ 2,399	8	78,307	69,820	+ 8,487	„	12	2	10½	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	54	45	85	411/16
	Bolivar	174	July, 1937	5,800	– 800	30	40,800	47,600	– 6,800	6 p.c. Deb.	9	5	8½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	16	11½	15½	3¼
	Buenos Ayres & Pacific	2,806	21.8.37	80,707	+ 4,960	8	608,499	565,954	+ 42,545	Ord. Stk.	17½	6	11	Nil
	Buenos Ayres Central	190	7.8.37	$158,200	+ $19,200	6	$851,300	$668,700	+ $182,600	Mt. Deb.	31½	11	31	Nil
	Buenos Ayres Gt. Southern	5,084	21.8.37	117,742	+ 4,502	8	900,062	831,192	+ 68,870	Ord. Stk.	31¾	13¾	24½	Nil
	Buenos Ayres Western	1,930	21.8.37	53,350	+ 11,874	8	346,961	302,611	+ 44,350	„	29¾	11	21½	Nil
	Central Argentine	3,700	21.8.37	132,115	– 6,063	8	1,065,445	996,293	+ 69,152	„	32932	8¾	24	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	21	4½	11½	Nil
	Cent. Uruguay of M. Video	980	14.8.37	13,716	– 1,253	7	98,198	98,432	– 234	Ord. Stk.	7¾	3	5	Nil
	Cordoba Central	1,218	21.8.37	35,550	– 2,240	8	311,240	288,280	+ 22,960	Ord. Inc.	5	1	4½	Nil
	Costa Rica	188	June, 1937	31,051	+ 4,093	52	249,333	186,880	+ 62,453	Stk.	36½	32	34	5¾
	Dorada	70	July, 1937	15,100	– 900	30	105,500	95,300	+ 10,200	1 Mt. Db.	107	101½	104½	5¾
	Entre Rios	810	21.8.37	16,060	+ 3,781	8	107,716	92,289	+ 15,427	Ord. Stk.	17	6	11	Nil
	Great Western of Brazil	1,092	21.8.37	6,200	+ 400	34	242,300	253,800	– 11,500	Ord. Sh.	1/2	5/16	1/2	Nil
	International of Cl. Amer.	794	June, 1937	$417,942	+ $38,950	26	$3,205,632	$2,996,509	+ $209,123	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/2	–/6	1/2	Nil
	La Guaira & Caracas	22¾	July, 1937	4,415	– 495	31	38,120	32,250	+ 5,870	Stk.	9	3	7½	Nil
	Leopoldina	1,918	21.8.37	29,946	+ 2,743	34	767,779	610,166	+ 157,613	Ord. Stk.	10½	3½	5	Nil
	Mexican	483	21.8.37	$299,300	+ $4,700	8	$2,142,300	$1,833,600	+ $308,700	„	1¼	1/4	1/2	Nil
	Midland of Uruguay	319	July, 1937	7,516	– 237	4	7,546	7,783	– 237	„	1½	1/8	1/2	Nil
	Nitrate	384	15.8.37	5,622	+ 2,505	32	100,988	84,113	+ 16,875	Ord. Sh.	63/6	41/9	2⅝	Nil
	Paraguay Central	274	14.8.37	$3,315,000	+ $901,000	7	$23,252,000	$17,191,000	+ $6,061,000	Pr. Li. Stk.	85	71	81½	7⅝
	Peruvian Corporation	1,059	July, 1937	81,134	– 3,187	5	81,134	84,321	– 3,187	Pref.	15	9	10	Nil
	Salvador	100	21.8.37	¢10,127	+ ¢251	8	¢93,629	¢81,499	+ ¢12,130	Pr. Li.Db.	18	16	22½	Nil
	San Paulo	153½	15.8.37	36,256	+ 7,728	33	1,074,483	975,046	+ 99,437	Ord. Stk.	86	46½	86½	5¾
	Taltal	160	July, 1937	2,940	+ 415	4	2,940	2,525	+ 415	Ord. Sh.	11532	14/–	11⅛	8⅞
	United of Havana	1,353	21.8.37	20,377	+ 4,281	8	143,118	121,913	+ 21,205	Ord. Stk.	3¼	1	3	Nil
	Uruguay Northern	73	July, 1937	766	– 139	4	766	905	– 139	Deb. Stk.	5	3	8	Nil
Canada	Canadian National	23,773	14.8.37	714,214	+ 62,961	33	23,750,479	21,456,114	+ 2,294,365	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—4 p.c.	Perp. Dbs.	76	51	68	5⅝
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104¾	99¾	101	315/16
	Canadian Pacific	17,228	21.8.37	512,400	– 8,000	34	17,311,000	16,204,000	+ 1,107,000	Ord. Stk.	16¾	10115/16	11½	Nil
India†	Assam Bengal	1,329	31.7.37	40,717	+ 6,193	18	436,782	408,614	+ 28,168	Ord. Stk.	87¾	82¼	77½	3⅞
	Barsi Light	202	31.7.37	3,240	+ 735	18	49,740	44,850	+ 4,890	Ord. Sh.	77½	65½	48	10716
	Bengal & North Western	2,111	10.8.37	69,347	+ 9,631	19	1,123,946	1,014,053	+ 109,893	Ord. Stk.	319	2925/8	308	5⅞
	Bengal Dooars & Extension	161	10.8.37	4,067	+ 603	19	46,960	44,358	+ 2,602	„	127½	118	92½	515/16
	Bengal-Nagpur	3,268	10.8.37	151,500	+ 13,386	19	2,550,584	2,255,040	+ 295,544	„	104	100¼	90½	47/16
	Bombay, Baroda & Cl. India	3,072	20.8.37	200,100	+ 21,675	20	3,507,525	3,255,150	+ 252,375	„	114	110½	111½	5⅛
	Madras & Southern Mahratta	3,229	31.7.37	166,875	+ 17,707	18	1,964,588	1,951,802	+ 12,786	„	116½	108½	108½	7⅛
	Rohilkund & Kumaon	546	10.8.37	10,176	– 125	19	212,516	206,085	+ 6,431	„	311	286	310	513/16
	South Indian	2,531¾	20.7.37	111,663	+ 7,484	16	1,291,649	1,263,953	+ 27,696	„	107½	10525/16	101½	57/16
Various	Beira-Umtali	204	June, 1937	91,505	+ 27,313	40	676,896	577,342	+ 99,554	—	—	—	—	—
	Egyptian Delta	620	31.7.37	7,258	+ 745	16	76,566	70,137	+ 6,429	Prf. Sh.	2¼	1⅝	1⅜	Nil
	Great Southern of Spain	—	—	—	—	—	—	—	—	Inc. Deb.	1½	1/8	3½	Nil
	Kenya & Uganda	1,625	May, 1937	216,935	– 20,539	22	1,334,126	1,229,899	+ 104,227	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50½	37	46	7⅝
	Midland of W. Australia	277	June, 1937	10,968	– 993	52	155,208	161,372	– 6,164	Inc. Deb.	97	93½	95	4516
	Nigerian	1,900	3.7.37	36,759	+ 12,237	14	754,205	401,243	+ 352,962	—	—	—	—	—
	Rhodesia	2,451	June, 1937	419,881	+ 130,017	40	3,352,058	2,584,870	+ 767,188	4 p.c. Db.	107	103½	107½	3¾
	South Africa	13,263	24.7.37	623,260	+ 22,952	17	10,342,358	9,656,351	+ 686,007	—	—	—	—	—
	Victoria	4,774	Mar., 1937	928,173	+ 61,468	39	7,634,016	7,418,938	+ 215,078	—	—	—	—	—
	Zafra & Huelva	112	May, 1937	12,899	+ 4,079	22	70,216	48,574	+ 21,642	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements are based on the current rates of exchange and not on the par value.